1890.

FRANK H. CLEMENT,

WOOD-WORKING MACHINERY,

ROCHESTER, N. Y.

U. S. A.

ILLUSTRATED CATALOGUE.

1890.

Wood-Working Machinery.

Frank H. Clement,
220, 222 224 and 226 Mill St.,
ROCHESTER, N. Y.,
U. S. A.

IMPROVED PATENT.

NINETEENTH YEAR.

UNION AND ADVERTISER PRESS ROCHESTER N Y

INTRODUCTORY.

THIS book is issued for the use of proprietors, foremen, superintendents and purchasing agents of works, and is intended to be filed away for reference. Have the kindness to take care of it after looking it through, and when in want of anything that I make, write me for net prices.

ATTENTION IS ASKED

to some facts in regard to my work and methods of production.

First.—I am thoroughly familiar with every detail of my factory, from the drawing office down, having been over twenty-seven years in mechanical business.

Second.—I make no "cheap" or low priced work; on the contrary, I take a great deal more pains with the fitting of slides, screws, journals and joints than many competitors who advertise to do only first-class work.

Third.—Nearly everything in my list is made in large lots by men who do nothing else, and many costly special tools have been constructed, and as a consequence, good work is produced at the lowest possible cost.

Fourth.—All high speed journals are of steel and are fitted by first-class mechanics with the greatest care, and the same care is used in scraping boxes and aligning spindles and tables, so that bearings will not heat, and all parts be true and square.

Fifth.—The weight of various parts of machines is greater than those of nearly every other maker, and every detail has received careful attention with regard to strength and resistance to vibration.

Sixth.—The increase in my business—which has doubled itself twice in eight years—is a fair indication of the success of my machinery in the hands of users, and should be a guarantee of its quality.

Seventh.—I do not expect nor receive unreasonable profits, nor such as are received by makers who do much more talking, but furnish less for the money.

I am sure I shall be borne out in the above statements by old customers, who prefer my work to that of other makers, for just the reasons above stated.

☞ All my work is finished in one coat of iron filler, rubbed down, one coat of steel-colored paint, and one coat of varnish.

Rochester, N. Y., April, 1890.

FRANK H. CLEMENT.

TO CORRESPONDENTS AND CUSTOMERS.

WHEN writing, do not fail to give full address, with County and State, and write proper names carefully. I receive many letters and cards, the signatures and addresses on which are unintelligible and have to be guessed at.

REMITTANCES may be made by check or draft on New York or Rochester, by P. O. order or note, or by express. I am obliged to return local (or country) checks for small amounts to the senders. The cost of collecting them is too great.

STRANGERS will please send references when ordering goods, and thereby save time and trouble to both parties.

IN ORDERING machines, state just what you want, and whether any extra parts or special attachments are needed, and give shipping directions. In the absence of special instructions, I ship by the best and cheapest route, so far as I can obtain information.

IN ORDERING band-saw blades, state width and length, and whether they are to be joined, filed or set.

WHEN PARTS OF MACHINES are wanted for repairs, it is better to return the old ones by express, prepaid. This saves time and avoids mistakes.

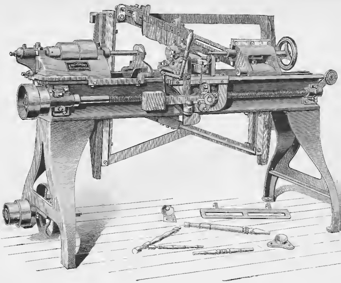
WHEN PULLEYS are wanted, give diameter, face, exact bore, and whether straight or crowning on the face.

WHEN SPOT CASH prices are quoted, it means money with the order, or prompt remittance on receipt of goods.

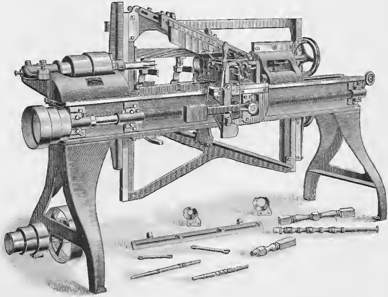
ALL CLAIMS for errors must be made promptly on receipt of goods.

BRIGHT WORK is "slushed" or greased when shipped, and should be cleaned with waste and kerosene (or benzine). Do not start a machine until it is carefully cleaned up.

IF A MACHINE fails to work just right the first time, do not condemn it or the maker, until you have investigated and comprehended details that the manufacturer has spent time and money on to perfect, but which may have escaped your notice. I shall always be ready to explain the details of any machine to customers or correspondents.



No. 1 Automatic Lathe. 30 inches between centers.



No. 2 Automatic Lathe. 40 or 50 inches between centers.

PATENT AUTOMATIC BACK-KNIFE LATHES.

No 1 LATHE.

THIS lathe turns stock as large as 2 inches diameter and 30 inches long, and will leave squares 1¾ x 1¾ at any point It will take all ordinary light chair work, furniture spindles, duster and brush handles, etc., down to ¼ inch smallest diameter, and 3 inches long The patterns are all new and greatly improved over any lathe now made, the novel and important features being covered by several patents.

The Bed is very strong and well tied transversely, and the legs and all attached parts extra heavy and firmly secured.

The Main Boxes are long and lined with best quality of babbitt metal carefully scraped to the journal, and the caps are planed into ledges to prevent side motion.

The Turning Chisels are usually two in number, one before the "die" or center rest, and a former or V behind it and just before the back knife. Both have my patent adjustable screw tool-stocks by which they may be adjusted in the cut while the lathe is in motion. A gauge or finishing chisel may take the place of the V for gauge work.

The Main Arbor, Centers and Tail Spindle are of crucible steel, the first and last named being hardened at the ends, and end pressure taken on hard steel washers against a bronze stop.

The Feed Screw is of steel with a heavy thread, cut so as to resist wear, and has a bronze friction collar to take up end motion.

The Patent Feed Nut is nearly five times the diameter of the screw in length, and closes squarely into the thread. This improvement is a very important one and greatly reduces the wear at this vital point.

The Tail Center has double tapering bearings, and is very long and rigid, the wear being taken up by an end adjustment screw.

The Back Gate moves in carefully scraped ways firmly secured to the bed and tied to each other. There are rope sheaves at each end for counterbalancing, and the hanger connecting it to the carriage is vertically adjustable by a screw and arranged to take up wear.

The Patent Intermediate Knife Bed, to which the pattern knives are attached, is used exclusively in these lathes, and saves a great deal of time in "setting up" for a change of work, and also avoids shifting knives for sharpening and re-adjusting afterward. This device also often saves a large item of expense for pattern knives.

A Self Centering Attachment is furnished in one of two forms; either a sliding cup, concentric with the spur center, as shown in the engraving, or arms swinging through the back gate and supporting the stock on brackets until caught on the centers. This arrangement is shown in cut of No 2 Lathe.

Cut Off Attachments are furnished when ordered in the usual form.

Parts Furnished. One set of (2) turning chisels, 3 dies, 2 spur centers, 3 knife beds, 4 sheave brackets for balancing weights, complete countershaft with cone pulley, etc ; also printed directions for setting and operating. Shipping weight 1,300 to 1,400 pounds.

Counter-shaft has T. and L. pulleys 10 x 5½, and should run about 1,000

☞All Pattern Knives extra

No. 2 AUTOMATIC LATHE.

This lathe is made either 40 inches or 50 inches between centers as ordered, and will turn to 2½ inches diameter, and leave squares on 2¼ x 2¼ stock It takes all ordinary chair stock, small stand and table legs, balusters, handles, spindles, etc, down as small as ⅜ inch diameter and 4 inches long. This is a favorite size for general work, and there are a large number of them in use in the best shops in the country.

Description of details on No. 1 Lathe applies to this size also, except where otherwise stated.

It has hammered steel spindles and centers ; long, finely fitted bearings, deeply-cut feed screw ; patent feed nut five times the diameter of screw in length ; hardened steel and bronze end steps for main spindles ; double tapering bearings on tail spindle ; all tool stocks adjustable to the cut with screws while the lathe is in motion ; double balanced back-knife gate ; patent intermediate knife beds ; self-centering attachment in either form ; complete countershaft.

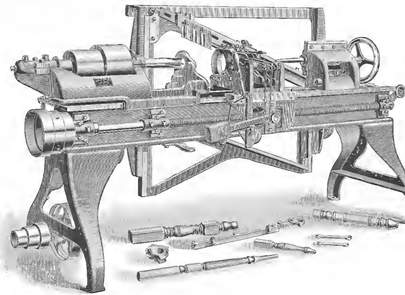
On this lathe there are 3 tool stocks, and by detaching the back-knife gate it becomes a first-class gauge lathe By the use of the 3d chisel a large expense for pattern knives is often saved, the latter not being required in places where the finishing chisel can be advantageously used

Parts Furnished. One set of (3) turning chisels ; 3 dies or center rests ; 2 spur-driving centers ; 3 knife beds ; 4 sheave brackets and set of wrenches.

The Counter-shaft has 10 x 6¼ T. and L. pulleys, and should run 900 to 1,000 per minute

Shipping weight 1,700 to 1,900, according to length

☞All Pattern Knives extra



No. 3 AUTOMATIC LATHE,

40 or 50 Inches Between Centers.

This is the only successful machine for turning table and furniture legs of all kinds with squares, crib and bed posts, neck-yokes, and similar heavy work, there is now in the market.

It is very heavy and substantial in all its parts, and has all the attachments and improvements suggested by long experience in manufacturing and operating this class of machines There are four turning chisels, all with patent screw-adjusting stocks, and work from 1 inch at smallest diameter up to 4 inches can be turned, and squares left on 3½ x 3½ stock. The same care has been taken in its design and construction as in the other sizes previously described, and the details are similar, except where otherwise stated.

It is made either 40 inches or 50 inches long between centers, as ordered, and is a fine general tool for shops having a great variety of work, small and large.

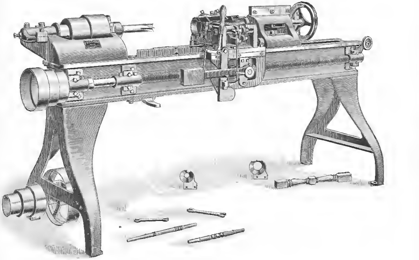
All Workmanship and materials are first class, and the fitting is done only by careful and experienced workmen. Shipping weight, 2,400 to 2,700 lbs. Countershaft has T. and L. pulleys 12 x 7¼, and they should run 800 to 900 per minute.

☞All Pattern Knives extra.

PATTERN KNIVES, TURNING CHISELS, ETC.

I am prepared to furnish Pattern Knives for all automatic lathes of both the cylinder and back-knife form. Having had a long experience in this class of work, I can guarantee satisfaction when a reasonably good sample stick is furnished. I use the finest edge tool steel and take great pains with the fitting and tempering. I make the heaviest knife per inch of any manufacturer. The price will vary according to the weight or depth of the steel required, but will be reasonable in all cases.

I usually have on hand Roughing, Forming and Smoothing Chisels for lathes of my own make.



PATENT AUTOMATIC GAUGE LATHES.

These are the machines shown on pages 4 and 6, with the exception that the pattern knife gate and slides are omitted

The Main Arbors and Centers, tail center, feed and tail screws, are of steel, and all the Babbitt bearings are extra long, and carefully scraped. The patent self-center is gibbed directly to the bed of the lathe, and is strong and accurate and will not tremble or chatter. It may or may not be used, according to the work in hand.

The Three Turning Chisels are arranged with adjusting screws, so that they can be set absolutely accurate as to diameter of stick without stopping either the feed or the lathe; the V, or forming chisel, is automatically lifted from the form on the return of the carriage so that the wear of the form is almost entirely avoided.

The Feed Screw and Nut and the automatic attachments for throwing off the feed, are extremely simple and sure in their action, and suitable arrangements are made for taking up the wear. The feed-nut is of the best quality of babbitt and may be easily replaced in the shop. There are 3 bearings on the feed screw.

The Tail Center revolves in double tapering babbitted bearings arranged to take up wear, the end pressure being taken on a phosphor bronze step.

Three Sizes of these lathes are made: No. 1, with bed 5 feet 6 inches long, which takes stock to 2 inches diameter and 30 inches long, 3 turning chisels. No. 2, taking in stock to 2½ inches diameter and 40 inches or 50 inches long, 3 turning chisels. No. 3, taking 3½ inches diameter and 40 or 50 inches long, 4 turning chisels.

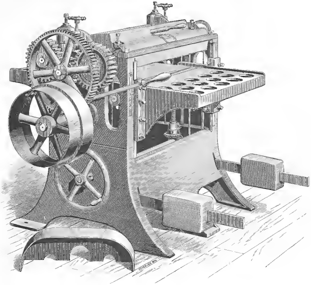
One Set of Turning Chisels, three dies and two spur centers are furnished with each lathe, and extras will be furnished at reasonable prices.

Counter-shafts with tight and loose pulleys and suitable cone pulley are included. All fitting is first-class, and all parts are designed with special regard to strength, convenience and utility.

Shipping weight: No. 1, 1000; No. 2, 40 inch, 1300; No. 3, 40 inch, 1800 pounds.

Tight and Loose pulleys: No. 1, 10x5¼; No. 2, 10x6¼; No. 3, 12x7¼.

Speed of Pulleys: No. 1, 1000; No. 2, 900 to 1000; No. 3, 800 to 900.



No. 1 Pony Planer and Smoother.

The engraving shows a new and fine design for a Single Surface Planer, made with special reference to doing smooth work, for caskets, furniture, carriages, sleighs, chairs, fine door and panel work, etc., and embodying many new and valuable features.

The Frame is unusually rigid and heavy, and it has three points of bearing on the floor. By this means it cannot be strained or twisted, either by bolting down or by settling of the floor, and the cylinder boxes can be kept screwed down close on the journals when running at a high speed, without heating, thus avoiding wavy work.

The Bed is very rigid, the web being 8 inches deep, and solidly ribbed under the cylinder, and it has six points of support on the frame, with gibs to take up lost motion, so that vibration under the cut is entirely avoided.

The Cylinder is a solid steel forging, with bearings 1⅝ inches diameter, and 7 inches long, and is very carefully fitted and balanced, special pains being taken to have the journals round, and bearings carefully scraped to them. The box-caps are planed into recesses to prevent vibration sideways, and have large oil cups.

The Feed Works are particularly strong and well arranged, and the gearing is extra heavy. They are driven from the countershaft by cone pulleys, and there is a lever to stop the feed by shifting the first pinion of out-gear lengthwise.

The Feed Rolls are set very close to the cylinder, and arranged to hold the board down firmly to the bed. The upper in-feed roll is fluted, and pressure is obtained by weighted levers in the most approved form. All the rolls are 3½ inches in diameter, and the upper ones are driven by the gearing.

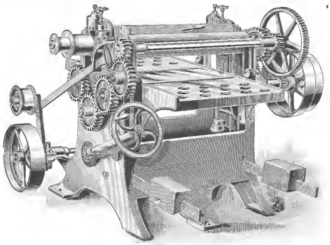
The Pressure Bars are carefully arranged and fitted, and pieces 4 inches long, or even less, can be planed smooth without dubbing the ends. The forward pressure bar rises and falls with the in-feed roll, and its working edge is faced with steel. Both bars work very close to the knives and are both adjustable to the lumber, independently of each other and the feed rolls.

Every detail has received careful attention and the fitting is done by experienced mechanics. All machines are belted up and tested before shipping.

Counter-shafts are included, unless otherwise ordered.

SCHEDULE.

WIDTH.	PLANES IN THICKNESS.	T. & L. PULLEYS.	SPEED COUNTER.	WEIGHT.
20 in.	$\frac{1}{16}$ to 6 inches.	10x5¼	900	1300 to 1600
24 in.				
28 in.				



No. 2 Pony Planer and Smoother.

The engraving shows a new and fine design for a Single Surface Planer, made with special reference to doing smooth and fast work, for caskets, furniture, carriages, sleighs, chairs, fine door and panel work, etc., and embodying many new and valuable features.

The Frame is unusually rigid and heavy, and it has three points of bearing on the floor. By this means it cannot be strained or twisted, either by bolting down or by settling of the floor, and the cylinder boxes can be kept screwed down close on the journals when running at a high speed, without heating, thus avoiding wavy work.

The Bed is very rigid, the web being 8 inches deep and solidly ribbed under the cylinder, and it has six points of support on the frame with gibs to take up lost motion, so that vibration under the cut is entirely avoided, and also dubbing the ends.

The Cylinder is a solid steel forging, with bearings 1⅝ inches diameter, and seven inches long, and is very carefully fitted and balanced, special pains being taken to have the journals round, and bearings carefully scraped to them. The box-caps are planed into recesses to prevent vibration sideways, and have large oil cups.

The Feed Works are particularly strong and well arranged, and the gearing is extra heavy. All adjustable gears travel together so as to be in uniform mesh and not ride on the points of the teeth, a weak spot in nearly every other machine.

The Pressure Bars are carefully arranged and fitted, and pieces 4 inches long, or even less, can be planed smooth, without dubbing the ends. The forward pressure bar rises and falls with the in-feed roll, and its working edge is faced with steel. Both bars work very close to the knives and are both adjustable to the lumber, independently of each other and the feed rolls.

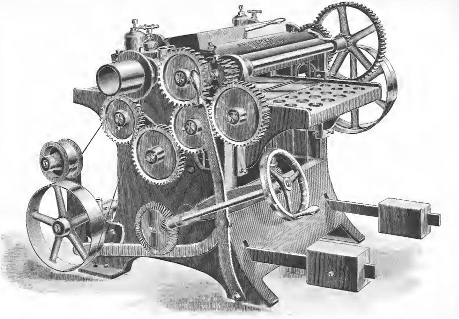
The Feed Rolls are set very close to the cylinder, and arranged to hold the board down firmly to the bed. The upper in-feed roll is fluted, and pressure is obtained by weighted levers in the most approved form. Every detail has received careful attention, and the fitting is done by experienced mechanics. All machines are belted up and tested before shipping.

The Cylinder is double belted, and the feed works are driven from it by means of a tightener and cone pulleys. All the rolls are geared together and driven, making a very strong and uniform feed. This pattern of planer makes a very satisfactory general machine for hard or soft wood for either heavy or light cutting.

Counter-shaft is included unless otherwise ordered.

SCHEDULE.

WIDTH.	PLANES IN THICKNESS.	T. & L. PULLEYS	SPEED COUNTER	WEIGHT.
20 in. 24 in. 28 in.	$\frac{1}{16}$ to 6 in	10 x 6¼	900	1500 to 1900



No. 3 Heavy Pony Planer.

This Planer is of the same general design as the No. 2 described on preceding page, but is considerably heavier, and has larger rolls and cylinder, and is adapted for heavier work and a faster feed.

The Frame is very rigid and has three points of bearing on the floor. By this means the cylinder caps may be kept close down without heating, and perfectly smooth work may be done.

The Bed is deeper and stiffer than any other planer on the market, and has six points of support on the frame with gibs to take up lost motion. The ways being outside of the frame and rolls, it is evident that the pressure of the top roll on the lumber cannot spring the bed and allow the cylinder to dub off the ends, as is the case with all centrally guided beds.

The Cylinder is a solid steel forging with three knives and capping lips, and the journals are 2 inches diameter and 8 inches long, very carefully fitted and boxes scraped to them. The box caps are planed into recesses to avoid side motion. The cylinder is driven from both ends.

The Feed Works are especially strong and well-arranged, and all adjustable gears travel together so as to be in uniform mesh at all times, a feature not found in other machines.

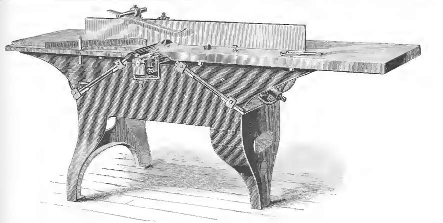
The Forward Feed Roll is geared at both ends so that there is equal pressure on the lumber for its whole length, the pressure being obtained from levers and weights in the most approved manner. No other Pony Planer has this improved method of gearing.

The Pressure Bars are carefully arranged and fitted, and when working hang about 2½ inches apart; thus pieces 4 inches long may be planed smoothly without dubbing the ends. Both bars are adjustable to the lumber independently of the rolls.

The Feed Rolls are set close to the cylinder and arranged to hold the lumber hard down on the bed. The upper in-feed roll is usually fluted but may be smooth when so ordered. All rolls are geared and driven, and the feed is very strong, being taken directly from the cylinder, and made variable by cone pulleys in addition to variations obtained by the tightener on the first feed belt.

Counter-shaft is furnished unless otherwise ordered. T. and L. pulleys are 12 x 6¼, and should run about 900.

I make two sizes, 26 inches wide, weight about 2,200; 30 inches wide, weight 2,500.



PATENT "PERFECTION" BUZZ PLANER AND JOINTER.

This Machine is not only "perfection" in name, but in the opinion of experts who have used it, is as near perfect in design and construction as any tool can be.

The Frame is cast in one piece, is very heavy and strong, and has three points of bearing on the floor. The table carriages move on continuous inclined ways, and are deeply ribbed in both directions. The cutter-head is a solid steel forging, with main bearing five diameters in length and self-oiling boxes. The rear table has a rabbeting groove ⅝ of an inch deep, and an adjustment for making glue joints.

An Adjustable Bevel Gauge is provided, secured to the rear or short table so as not to interfere with the movement of the working table. By a special system and tools the frame and tables are planed absolutely exact, so that no further fitting, adjusting or lining up is required.

The Width of Throat averages 1⅜ inches. ***All Tables*** are 7 feet long.

The Cylinder Boxes are cast together in a yoke and rigidly bolted to the frame, the yoke being adjustable vertically by means of set screws. Thus the cutter-head may be always kept level with the tables, even when the boxes are much worn.

The Wedge-Shaped Cross-bar can be slipped back on the inclined ways by slacking two thumb screws. The rear table will then drop down sufficiently to make a spring or glue joint.

Both Tables can be drawn away from the cutter-head on a level independently of the inclined ways, so as to leave an opening about 7 inches wide; and dovetailed slots are planed in the cutter-head into which special bolts with nuts are fitted. This arrangement admits of moulding, tonguing, and grooving, and other special cutters being attached without removing the straight knives. Thus surfacing and beading, surfacing and moulding, surfacing and grooving, etc., may be done at one operation.

No Other Buzz Planer has the adjustments, solidity of construction, and advantages of this one, nor can others do the wide range of work of which this is capable; such as squaring, smoothing, taking out of wind, glue-jointing, beveling, chamfering, rabbeting, moulding, tonguing and grooving, beading, cornering, cross-graining, tenoning, etc. It will also stick curved mouldings, such as casing-heads, special inside finish mouldings, etc., which have heretofore been done by hand.

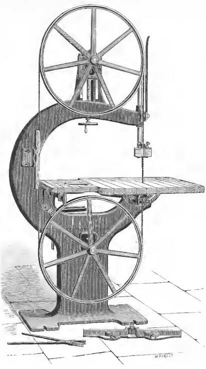
Note the Advantages. There are no links, wedges, pin-joints, cams or eccentrics under the table to get out of adjustment, or wear slack; by putting the frame on three legs it is impossible to strain or twist it by bolting down or by the settling of the floor, and there is no projecting flange for the operator to tread upon. By means of the large hand-wheel at the right, the working table can be moved instantly either way, without requiring the operator to change his position in the least. The design and method of fitting up is such that the tables must be true and remain so, and they cannot twist, rock, strain or be displaced.

Counter-shafts are included unless otherwise ordered. ***Workmanship first-class.***

Spring Attachments for mouldings, extra.

SCHEDULE.

Width of Cut.	T. & L. Pulleys.	Speed.	Shipping Weight	Horse Power.
8 inches.	8x3½ inches	900	750 pounds.	About ¾
12 inches	8x3¾ inches	900	1000 pounds	About 1
16 inches.	8x4¼ inches.	950	1200 pounds.	About 1½
20 inches	9x5 inches.	950	1500 pounds.	About 2
24 inches.	10x5 inches.	950	1700 pounds.	About 3



30-INCH BAND-SAW MACHINE.

This machine has been designed with special reference to the demand for a good, well-planned, thoroughly-built tool, which can be sold at low figure. The materials are of the best quality in every particular, and there is nothing cheap or carelessly fitted about them.

The Frame is cast in one piece and cored hollow (not open at the back), and this size as well as all others of my make, has been carefully tested under the strain of blades wider than those here recommended, and found to be perfectly rigid. The wheels have my improved concave arm and are carefully turned, balanced and covered with pure rubber, strengthened against stretching, and fastened with a special cement The bearings are four diameters in length, and the boxes are lined with a fine grade of Babbitt metal. The shafts are of steel ; the loose pulley is self-oiling, and the hub is extra long , the upper wheel has a vertical adjustment to strain the blade, and a swinging adjustment to shift it on the face, and it is cushioned on the straining screw by means of a long range tempered steel spring.

The Tables are of kiln-dried hard wood (unless ordered of iron), and the main table can be tilted to an angle, and has a clamp-bar across the slit , the guides are of hardened steel and have all necessary adjustments ; the belt shifter is adjustable for any direction of belt. There are also sawdust brush, blade guard for upper wheel, and sway guides provided.

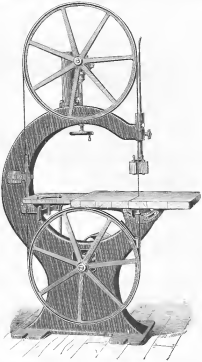
This Machine is well adapted to the lighter grades of work of any kind, such as is found in Carpenter, Bracket, Pattern, Cabinet, Chair, Toy and Job shops, and in Car, Wagon, Millwright and Agricultural shops, where the heavy work is done on a larger machine.

Blades to ¾ inch wide may be used on it. I furnish with each machine, wrench, scarfing-frame, tongs and one blade ready for use, and pack the whole carefully and deliver on cars here.

Iron Table Extra. Machine requires about one horse power.

DIMENSIONS.

EXTREME HEIGHT.		FLOOR ROOM.		TABLE SURFACE.	SAWING SPACE.	PULLEYS.	DIAMETER WHEELS	REVOLUTIONS.	LENGTH OF SAW.		SHIPPING WEIGHT.
feet	inches	feet.	inches.	inches.	inches.	inches.	inches.	450 to 500	feet.	inches.	750 to 850
7	3	3 x 4	3	30 x 42	12 x 30	12 x 3¼	30		16	6	



34-INCH BAND-SAWING MACHINE.

THIS SIZE HAS STRAIN LEVER SAME AS 37 AND 42 INCH SAW

As now constructed, this machine, for working qualities and endurance, has no superior in the market of whatever make or price. Besides the fineness of the design and quality of the workmanship, it has a number of patented devices which add much to its value.

The Main Guide is a model of simplicity and convenience. The back plate is of hard steel and is self-adjusting, so as to always come to a full bearing against the blade. The side blocks (either steel or wood) are held by thumb-screws above the guide so as not to interfere with seeing the lines on the work, and there is a self-oiling attachment for the back of the blade.

The Improved Balance-Lever straining device is also applied to this machine, together with a sawdust chute and brush for lower wheel, blade guard for upper wheel, intermediate steady guides for the blade, etc.

The Main Frame is cored out and cast in one piece; the shafts are steel; the bearings are four diameters in length. of good Babbitt metal; the loose pulley is self-oiling and its hub is 6 inches long; the wheels are covered with canvas-strengthened, pure rubber bands, securely cemented and ground perfectly true; the upper wheel has a tilting device for shifting the blade on its face; the table is of kiln-dried hard wood securely fastened to a heavy segment-bar arranged to tilt to an angle; there is also an extension of the table over the lower wheel

The Wheels are made very light and strong, and are carefully turned and balanced, and every moving and adjustable part about the machine is carefully fitted

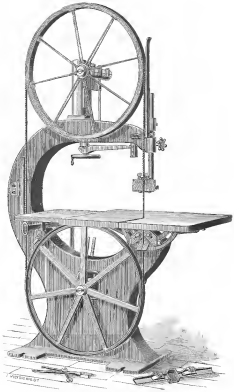
All Adjustments about the guides and straining device are made by the operator at his post without the use of wrenches Every complete machine includes one blade, joined, filed and set, scarfing-frame, tongs and wrench, all carefully packed and delivered F O. B. at Rochester.

I recommend this size for Agricultural, Bracket, Cabinet, Car, Chair, Carpenter, Carriage, Sash and Door, Wagon, Pattern and Job shops, Planing Mills, etc. It is well adapted for all medium work in hard or soft wood, and will do as much and as good work as 36-inch machines offered by other makers. Blades to one inch wide may be used on it.

Iron Table extra. Striegel's Patent Guide extra. About one-horse power is required.

DIMENSIONS.

EXTREME HEIGHT.		FLOOR ROOM.		TABLE SURFACE	SAWING SPACE	PULLEYS	DIAMETER WHEEL	REVOLUTIONS.	LENGTH OF SAW		SHIPPING WEIGHT.
feet.	inches.	ft. in.	ft. in.	inches.	inches.	inches.	inches.		feet.	inches	
7	8	3 3 x	4 8	34 x 50	12 x 34	12 x 3¾	34	400 to 450	18	4	950 to 1100



37-INCH BAND-SAWING MACHINE.

(MADE WITH IMPROVED BICYCLE UPPER WHEEL, OR BOTH WHEELS OF IRON AS ORDERED.)

37-INCH PATENT BAND-SAWING MACHINE.

BY RECENT improvements, this well-known tool has been rendered more efficient and durable than any of its kind now made, elegance and adaptability of design, quality of workmanship and materials, and capacity for hard, continuous work, considered

In the Blade-Straining Device, a balance lever is made to show on an index plate the amount of tension necessary for any size of blade. There is always an elastic strain on the blade, thus avoiding a serious difficulty in counter-weighted machines, by which light blades are strained rigidly when the weight is set for a wide blade and carelessly left there by the operator, as often happens

The Upper Wheel, when so ordered, is built up like a bicycle wheel, with a dry white pine rim, carefully glued up in segments and secured to steel arms by brass foot plates, the arms are set bracing and tightened by jam nuts, and the joints in the rim are screwed through and through, making the lightest and strongest wheel in the market. For heavy work with wide blades, both wheels are preferably of iron, and the machine in this form is somewhat lower in price

The Shafts are of steel and have good Babbitt metal bearings 7½ inches long. The upper bearing is adjustable, so as to shift the blade on the wheels. The loose pulley is self-oiling, and its hub is 6 inches long

The Frame is hollow and cast in one piece, according to the best modern practice, and is carefully designed and proportioned for strength. Hardened steel, self-oiling guides are furnished above the table, having all necessary adjustments, and so arranged that wood may be used for side guides if preferred

The Table is of kiln-dried cherry, or iron if ordered, bolted to a heavy segment bar planed true and square, and arranged so as to tilt to an angle. All boxes are divided and arranged to take up wear. This size is adapted to general work of all kinds, such as is found in Agricultural, Cabinet, Car, Chair, Carpenter, Millwright, Pattern, Wagon and Job shops, in both hard and soft wood, and can be arranged for re-sawing or splitting lumber up to 15 inches wide.

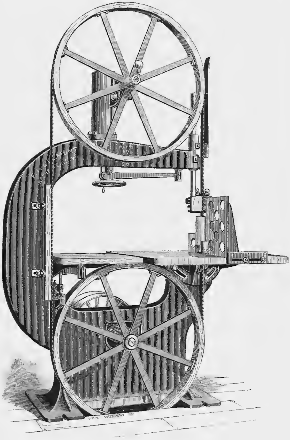
I furnish with each machine, wrench, scarfing-frame, tongs, and one blade, joined, filed and set, and pack the whole and deliver at depot here, without extra charge. I send also printed directions for setting up and operating.

Iron Table extra. ***Striegel's Patent Guide*** extra

About two-horse power is required

DIMENSIONS.

EXTREME HEIGHT.	FLOOR ROOM.	TABLE SURFACE	SAWING SPACE	PULLEYS	DIAMETER WHEELS.	REVOLUTIONS.	LENGTH OF SAWS	SHIPPING WEIGHT.
ft in	ft in ft in	inches.	inches	inches	inches		ft. in	
8 3	3 10 x 5 4	36 x 54	15 x 36½	14 x 4¼	37	375 to 400	19 9	1350 to 1550



42-INCH BAND-SAWING MACHINE.

(HAND SPLITTING-GAUGE SHOWN ON THE TABLE IS AN EXTRA.)

42-INCH PATENT BAND-SAW MACHINE.

THIS machine is made on the same frame as the re-saw described on following pages, the wheels and shafts being lighter and the pulleys smaller in diameter and face.

THE WHEELS are 42 inches in diameter and 2½ inches face, the upper one with seasoned wood rim glued up in segments, and the lower one of iron. They are covered with rubber, ground true and accurately balanced. The arms are hollow, light, and strong, and there is no difficulty in doing all grades of work from the lightest to the heaviest.

THE GUIDES have hardened self-adjusting back bearings, and hard wood side guides endwise of the grain, and blades may be run on it from 3-16 to 1 1-2 inches wide with safety. The splitting gauge shown, together with pressure roller, is furnished when ordered, and very satisfactory resawing can be done with it.

THE BLADE is strained with my patent balance lever and index, the same as in the 42-inch Re-saw, and this device leaves nothing to be desired for the purpose intended.

THE TABLE is usually of wood, 40x42 inches, kiln-dried, glued up in strips, and bolted to a heavy segment bar to prevent warping. It is nicely jointed up and finished in shellac. An iron table will be furnished when ordered, at an extra charge.

A BELT SHIFTER, extension of table over lower wheel, chip guard and sawdust brush are provided, and the guide spindle is counter-balanced (not shown) so as to be easily set at any point. Wrench, scarfing frame and tongs go with each machine, and there is no extra charge for packing and delivery at depot here.

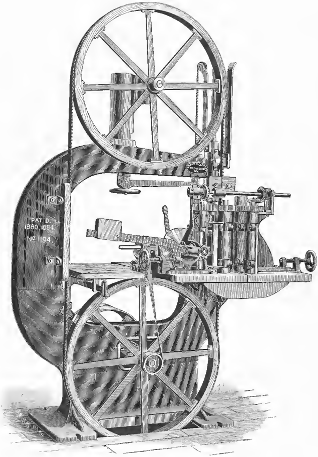
This size of saw is adapted to all kinds of heavy work such as is found in Millwright, Car, Wagon, Carriage, Agricultural, Carpenter and general shops, and will give unqualified satisfaction on any grade of work.

From two to four horse power is required.

Hard steel Roller Guide, or Striegel's Patent Guide extra.

DIMENSIONS

EXTREME HEIGHT.	FLOOR ROOM	TABLE SURFACE.	SAWING SPACE.	PULLEYS	DIAMETER WHEELS.	REVOLUTIONS.	LENGTH OF SAWS	SHIPPING WEIGHT.
ft.	ft. ft	inches	inches	inches	inches		ft in.	1850
9	4 4 x 7-8	42 x 62	21 x 42	16 x 5	42⅜	350	22 9	2200


PAT'D.
1880. 1884
Nº 194.

PATENT

COMBINED SCROLL AND RE-SAWING MACHINE.

LOWER WHEEL NOW MADE OF IRON.

COMBINED SCROLL AND RE-SAWING BAND-SAW.

THIS machine is designed for those shops where there is some re-sawing and considerable scroll sawing, but where, for want of sufficient room or work, the use of a large special re-saw would not be advisable. It is carefully designed, heavy and powerful, having cored frame cast in one piece, extra heavy steel shafts, long bearings and large pulleys.

The Wheels are 42 inches in diameter, one with seasoned wood rim glued up in segments, and the lower one of iron. They are covered with rubber, ground true, and perfectly balanced. The arms are hollow, light and strong, and there is no difficulty in doing all grades of work from the lightest to the heaviest.

The Main Guide has a hardened steel back-roller, and the lower guide has a self-adjusting back plate. The side guides are hard wood, used endwise of the grain, and are adjustable for wide and narrow saws. All the adjustments of the guides and other parts can be made by the operator at his post. The guide spindle is counter-balanced and it can be moved easily and clamped at any point.

The Blades are strained with my patent balance lever and index, which is always elastic and permits the expansion and contraction of the blades, and the latter may be shifted on its face by a hand wheel which is in reach from the front of the machine.

The Re-Sawing Attachment consists of six rolls, four of which are geared together, the two smaller ones next the saw acting as guides. The rolls are strongly driven by a friction wheel and disk, by means of which the speed may be instantly varied from 10 to 25 running feet per minute, or stopped altogether by a convenient hand lever. All the parts of the feed works, including the driving belt, are immediately within the operator's reach, and the whole can be removed from the table in two or three minutes by one man.

The Table is of iron and is trussed underneath so as not to spring by the pressure on lumber, and it can be tilted to cut weather-boards, etc.

The Feed Works take lumber to 20 inches wide (or deep) and 4 inches thick, so as to cut at the center, or any point out of the center, and they will cut to the center of 7½ inches. Two panels, each ⅜ inch thick when planed on both sides, can usually be got out of the average of 1 inch stuff, or 5 pieces plump ⅛ inch thick not planed.

There is a third bearing outside the main driving pulleys and a floor stand for the same.

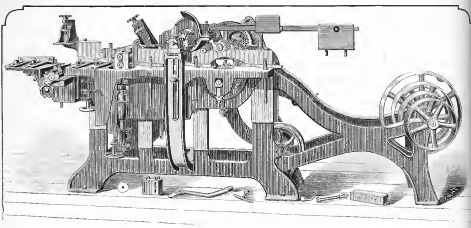
The tight and loose pulleys are 20 x 6 inches, and should run 350 to 400 per minute.

Blades.—One wide blade and one ½ inch or ⅝ inch are usually furnished with the machine, joined, filed and set so that everything is ready for the belts.

Shipping weight about 2,700 lbs.

From 3 to 5 horse power is required.

This is a valuable tool for casket, furniture, carriage, wagon, chair, carpenter, car and job shops, and will give good satisfaction with fair management.



IMPROVED

6-INCH AND 7-INCH FOUR-SIDE MOULDERS.

Many new points of advantage and convenience are embodied in these machines which will commend them favorably to all parties having use for a horizontal moulder to work one or more sides of lumber into any desired shape.

1st. A very solid and stiff frame, designed for great strength and strain.

2d. Extra heavy steel mandrels with long bearings, and boxes lined with genuine babbitt metal.

3d. Extra long belts, securing great purchase on the cutter-head spindles.

4th. The top head has lateral adjustment of one inch.

5th. The under head has lateral and horizontal adjustments.

6th. The outside head can be set on an angle and be adjusted without changing the angle on the 6 inch machine, and on the 7 inch, both inside and outside heads are so adjustable.

The heads can be adjusted while the machine is in motion. The feed is very powerful and has double feed rolls, with large friction roll in table on the 6 inch machine, and on the 7 inch, all rolls are driven. Four rates of feed are provided for.

The heavy shaving bonnet can be swung clear of main head, giving free access to the knives. It is also adjustable, and can be moved to or from the knives, thus giving great scope for the use of large moulding bits.

The under head is very quickly gotten at, the tail piece being hinged, and by loosening one screw it swings clear, giving free access to set or adjust or sharpen the knives without removing them. There are adjustable plates on each side of head, so as to increase or diminish the size of the throat as the knife varies. There is an outside bearing on the 7 inch machine for the top head arbor.

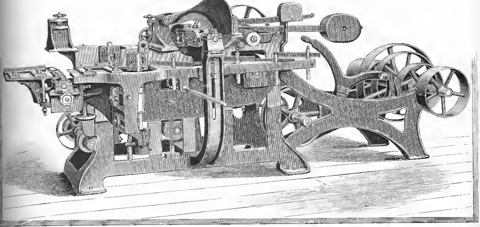
The feed is very strong, consisting of one lower and two upper rolls. The one upper roll is weighted and the other held firmly by springs. There is a connnection from the feed counter-shaft to the stud of the feed pulley, which acts as an outside bearing for the stud and takes the strain of the belt.

This machine has a binder for feed works instead of a clutch, which will be found much better.

Four, 4 slotted steel heads are furnished, and one extra capped sash head. Four sets of blank knives are included, and all necessary springs, wrenches, spur feed rolls, and fill-up collars.

SCHEDULE.

	WEIGHT.	T. & L. PULLEYS.	SPEED.
6 inch.	1500	10½ x 5	900
7 inch.	1800	10½ x 5	900



IMPROVED

9-INCH AND 10-INCH MOULDERS.

One of the main features of these machines is the solid outside bearing for the top cutter-head shaft, bolted to both frame and table, there are also other valuable improvements, which make them economical and convenient.

The Inside and Outside vertical headstocks are both adjustable, and can be moved to any angle or position desired, while the machine is in motion, with greater accuracy and speed than on any other machine.

The gibs that hold the table to the frame extend the whole width of the table, and the face of the frame is planed, so as to allow them to slide entirely to the top of it, thus holding the table very firmly.

The bolt that fastens the outside bearing to the table, extends entirely through the table into the gib, and clamps the table to the frame immediately beneath the top cutter-head, where it is most in need of a substantial support.

The Feed is very strong and powerful, consisting of two upper rolls and one lower roll, all placed very near the top cutter-head, to hold the lumber firmly while being operated on. The large roll is placed directly over the under one, and the under roll is operated independently of the top ones. All rolls are driven.

The Table in front of the under feed roll is planed one-eighth of an inch lower than the other parts of it; this is done to avoid friction, and to allow the lumber to be fed in on a line with the highest part of the table. When a table is planed straight, it is necessary to set the under roll one-eighth of an inch above the surface. When this is done, it raises the lumber that distance from the table, and it must be bent back to a solid bearing before it reaches the top cutter-head. To do this a great deal of pressure is necessary on heavy work; and the heavier the pressure is, the more power is required to feed in the lumber.

The Under-Head on this machine can be moved endwise, with a hand wheel, as well as up and down. The advantage of moving it endwise is very great, when doing any uneven work, as it is much easier to move the head with a screw than to re-set the cutters.

There are two sliding blocks or pieces dovetailed into the table in front and back of the lower cutter-head, for the purpose of chip-breaking, and for allowing mouldings to be sprung with that head. It has also an adjustable chip-breaker for the inside head.

There is a binder for feed-works, instead of a clutch, which will be found an advantage on heavy work, and there are four rates of speed.

The heads are all four-sided, cast-steel, slotted. I furnish five heads and five sets of cutters with each four-sided machine.

Nine inch size will dress four inches thick on four sides, and the table will lower sixteen inches.

Ten inch size will dress five inches thick on four sides, and has four driven feed rolls.

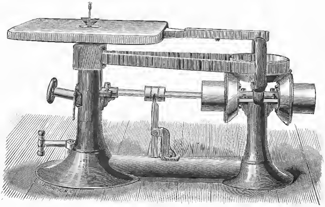
This size is also made with two top cutter-heads when ordered, at an extra price.

All necessary feed spurs, springs, pressure bars and wrenches are included.

The table is raised and lowered by means of two screws, which allow it to move freely without any strain on the gibs. The gears connecting the screws are covered with an iron box, to keep the shavings out.

SCHEDULE.

	WEIGHT.	T. & L. PULLEY.	SPEED.
9 inches.	3,200	12 x 8	850
10 inches.	4,200 to 4,500	12 x 8	900



SINGLE SPINDLE VARIETY SHAPER.—(Reversible.)

This Machine is Complete in itself—no separate counter-shaft, but all neatly built upon one base, combining great strength and durability.

The Mechanism for Raising and lowering the Spindle is within the upright that supports the table, and is operated by the hand-wheel.

The "T" on the Base of the Machine connects with an eccentric joint arranged between springs below the base plate, and works the shipping lever.

The "T" will Stand at any Angle, and is set to the right or left with the foot, and the operator's hands are free to move his work to the Cutter, which is thus under such command that it can be brought to full speed or a standstill in a second of time.

The Friction and Belt Pulleys are, in a manner, one, and therefore as light as is possible to make them.

The Counter-Shaft Bearings are placed immediately below the point of frictional contact to secure the power at once direct and strong. The operator has full and perfect command of the machine, *without moving out of position.*

To change Spindles, throw off the belt and run the housing, by means of the hand-wheel, to the top of the table when one part is readily changed for another part—having the size spindle wanted.

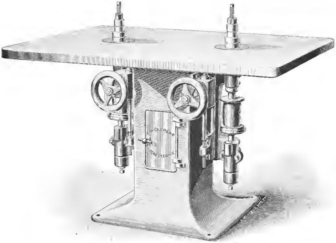
Driving Pulleys are seven inches in diameter, 5½ face, and should make one thousand revolutions per minute.

The Driving Belt shown on the Machine is 2½ inches wide, and runs from a pulley 13½ inches in diameter to a spindle pulley 2⅜ inches in diameter.

Length of Base, 5 feet 2 inches. Weight of Machine, 750 pounds.

One set (33) Guide Collars, one Reversible Cutter, and Belt go with each Machine.

Reversible Cutters of any pattern can be furnished with this machine or for other machines, at regular prices.



No. 2 Double Variety Moulder or Shaper.

This is a fine, high-class, carefully designed and nicely fitted machine in all its details.

The Frame is cast hollow in one piece, and is strong and massive. There is a closet in it for knives, collars, wrenches, etc.; and the table is firmly bolted to a heavy flange at the top.

The Main Spindles are of steel, 1½ inches in diameter, and are set 24 inches apart. The bearings are 6 inches long, and are connected by a heavy yoke which moves vertically on V's cast on the sides of the frame. These parts are specially heavy and rigid, and are so fitted that, with ordinary care of the boxes, there can be no vibration or heating of the spindles.

Separable Top Spindle Sections are provided when ordered, but usually the upper end of the spindles is turned down to $\frac{15}{16}$ of an inch, with a fine square thread for the clamping nut. Four steel collars, slotted for knives, and four filling collars are furnished, and one set (4) of blank knives.

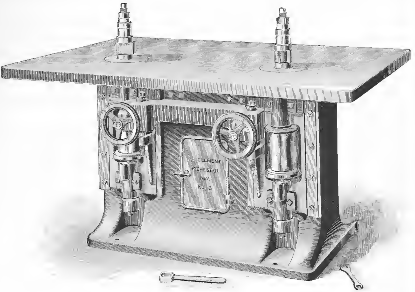
The Adjusting Screws and gearing are located in housings, firmly bolted to the frame, and convenient to the operator to reach while measuring from the top of the table. These parts are carefully fitted, and the jar of the belts will not change the adjustment.

The Table is usually 40 x 54 inches, of kiln-dried cherry, glued up in strips, dressed true and finished in shellac; but an iron table will be furnished when wanted, at an additional price. Iron rings, seven inches outside diameter, surround the spindles, and will fit in any table, either iron or wood.

The Counter-Shaft has tight and loose pulleys, 8 x 4¼ inches, and should run about 1,000, giving spindles 4,500, or more if necessary.

Shipping weight with Counter-Shaft—Wood Top, 900 lbs.; Iron top, 1,100 lbs.

Extra spindle sections and collars to order.



No. 3 Heavy Variety Shaper.

This is an extra heavy carefully designed machine adapted to the heaviest work demanded of any Shaper, such as Furniture, Wagons, Carriages, Cars, Plow Beams, Agricultural Machines, Railroad work, etc.

The Frame is cast in one piece, in box form, and is very rigid and heavy. It extends beyond the main spindle yokes at each side, and the belts pass through it, thus giving the boxes and spindles the utmost solidity. There is a closet for knives, wrenches, etc., and the table is firmly bolted to a broad top flange which nearly surrounds both spindles. Cutter heads or collars 6 inches diameter can be used if required.

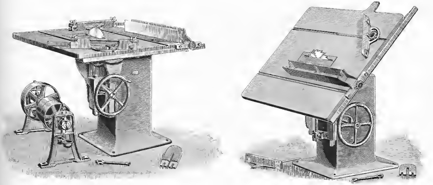
The Main Spindles are 2 inches in diameter in the body, and 1¾ inches in the top sections, and are set 30 inches apart. The upper bearings are 9 inches long and the connecting yokes are very heavy and supported for their whole length in V slides with take-up gibs, all carefully scraped to a solid bearing. The result of this construction is absolute rigidity under the heaviest cutting in hard wood. The box caps are planed into ledges to avoid side motion, and have self-oiling attachments, and the lower end of the spindles runs in a well of oil upon a bronze step with an adjusting screw.

Separable Top Spindle Sections are provided when ordered, from ⅝ inches diameter to 1¾ inches or more if required with square threads for the clamping nuts. Four steel collars slotted for knives, four filling collars and one set of four blank knives are furnished with each machine, and one pair of table plates.

The Adjusting Screws for the yokes are hung in a strong housing extending across the front of the machine, and the adjusting wheels are convenient for the operator at his work.

The Table is usually 44x62 inches surface, of kiln-dried cherry glued up in strips, or iron if ordered, (the latter extra) and both have separable rings around the spindles, the bore of which is adapted to the collar or cutter required.

The Counter-shaft has tight and loose pulleys 10x6¼ inches, which should run 900 to 1000, giving the spindles 3600 to 4000, or more if necessary. Extra spindle sections, collars and table rings to order. Shipping weight, wood top, 1600 lbs. With iron top 1900 lbs.



No. 1 Variety Saw-Bench.

This is a new and fine design for a general cutting-off and splitting saw-bench and combination machine for Pattern, Carpenter, Chair, urniture, Car, Wagon and Job shops, for light and accurate work.

The Frame is cored out in box form and cast in one piece, and is rigid and heavy.

The Table is all iron and rises and falls five inches in a direct line on gibbed slides, by a large hand wheel and screw, and it also tilts upward from the right hand side to 45 degrees. Iron cut-off and splitting gauges are provided, the former of which can be adjusted to 45 degrees in either direction, and they may be used on either or both sides of the saw.

The Adjustable End-Stop Gauges, as shown in left hand cut, are furnished only when ordered, at an extra price, but one plain swivel, one uare cut-off gauge and one splitting gauge are included in the price of the machine.

Jointing, Dadoing, Grooving, Rabbetting and moulding heads may be used, and the large iron throat plate in the center of the table can be removed instantly to facilitate changing heads or saws. Wood throat plates may be used as desired.

A Boring Attachment is added when ordered, with sliding and vertically adjustable table, having all necessary stops and gibs, and a fence for holding work.

All Parts are nicely fitted, and adjusted true and square, so that fine jointing can be done without subsequent hand fitting. The arbor has self-oiling boxes, carefully scraped to the journal, and there is provision for taking up end motion.

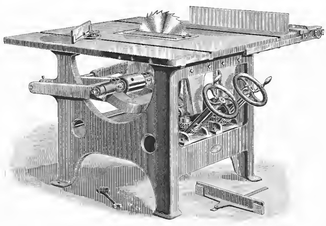
The Counter-Shaft is usually attached to the floor four to five feet from the machine, but it may be located below the floor. Either of these positions is far more satisfactory than attaching it to the frame of the machine. The tight and loose pulleys are 8 x 5 inches and should run 700 to 800.

The table surface is 36 x 44 inches, and stuff 20 inches wide may be slit. An 8-inch saw projects 1½ inches above the table, and 14-inch saws may be used.

Shipping weight, 800 lbs. Horse power required, about three.

This Tool is particularly recommended as a jobbing machine in a small shop, and when the boring attachment, jointing and rabbetting head are ordered with it a great variety of work can be done on it.

A Special Jointing Table made detachable is also furnished when required.



IMPROVED DOUBLE SAW-BENCH.

The engraving shows a new and greatly improved saw bench arranged with two arbors for carrying a cut-off and a rip saw at the same time. It is all iron and steel, and the frame is cast in one piece, and is strong and massive.

The Arbors are 1¼ inches diameter; collars are 4 inches, and pulleys are 4 inches by 5 inches face. The arbor frames swing on a heavy steel trunnion shaft, and the end next the operator is guided in a vertical way, so that there can be no side motion to the saw at any part of its adjustment.

The Adjusting Screws are very convenient, and the shifting of both arbors occupies only a small fraction of a minute.

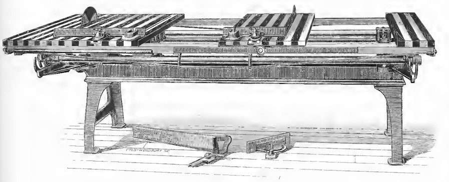
The Table is all iron, 44x48 inches surface, and has no crosswise slots, the splitting gauge being arranged on a way outside of the table. This gauge is adjustable to a miter and is accurately stopped at both miter and square, and can be set at any intermediate angle.

A Large Throat admits both saws, and an iron plate fills the opening, and can be lifted out instantly to get access to the saws. One arbor extends beyond the nut to accommodate cutter-heads of various kinds.

Cut-off Gauges are provided, one of which is adjustable to a miter, and they may be used on either side of the saw. Every part of the machine is conscientiously fitted, and table, gauges and arbors are carefully aligned and adjusted so as to do accurate work.

A Screw Adjustment for end play is provided on the arbors capable of being set very fine, and the journals are nicely fitted to scraped bearings so that they will not heat with fair treatment. Saws 16 inches diameter are used, and ordinarily the hole should be 1⅛ inches, but this can be varied to order. A 10-inch saw projects 2 inches above the table.

The Counter-shaft should be located on the floor, about 4½ feet from the center of the arbors. Tight and loose pulleys are 10x6 inches, and should run 600 per minute. One each, cross-cut and rip saws are furnished, 16 inches diameter. Horse power required, about three. Shipping weight, 1,000 lbs.



DOUBLE CUT-OFF SAW.

The above machine is a practical, common sense tool, that can be operated with less labor, and has in its construction fewer parts for the variety and class of work it is designed to do, than any other machine on the market.

No single or double cut-off saw has ever been made that will do the work as accurately, easily and quickly when shoved to and from the saw over stationary tables, as when carried to and from the saw on our improved anti-friction carriage.

The arbor is steel, finished 1¾ inches in diameter, supported on the left by two heavy bearings 6½ inches long with pulley between them. The opposite end has a 3½ inch pivoted bearing so made that it can be instantly swung away from the arbor for removing the saw. These bearings are self-oiling, fitted in the best possible manner.

The arbor is fitted for saws each side of its main bearings, while the movable saw is carried by an adjustable sleeve fitted for saws at either end, which moves freely along the arbor and can be instantly clamped to the same at any point between its bearings.

The carriage has a truss both on the front and back, which prevents any sagging or springing in the center, and rests upon four flanged differential wheels, having no fixed bearings, ***doing away with friction***. The two wheels on the front, also the two on the back of the machine, are connected by wrought shafts, so that both ends of the carriage must move exactly alike and square with the saws. When used as a slitting saw, the carriage is made stationary in a moment.

The left hand table is permanently fastened to the carriage, while the right is free to move along the carriage, carrying with it the movable saw for cutting material of different lengths.

We furnish with each machine counter-shaft, with tight and loose pulleys 11 inches diameter, 5½ inches face, which should make 550 to 600 revolutions per minute ; one improved slitting saw gauge ; one mitre gauge ; two cut-off gauges : one rip saw ; two cut-off saws 16 inches diameter, boxed and delivered on cars at factory.

POINTS OF SUPERIORITY.

It will cut both ends of the work at one operation, any length from 3½ inches to 6 feet eight inches long, 24 inches wide, 4½ inches thick, ***perfectly square***.

The carriage when carrying a plank weighing either 5 or 500 pounds, will move to and from the saws with a pressure of ***less than one pound***.

It will cut every piece exactly of one length and perfectly square, even if the pressure is applied to either ***extreme*** corner of the carriage.

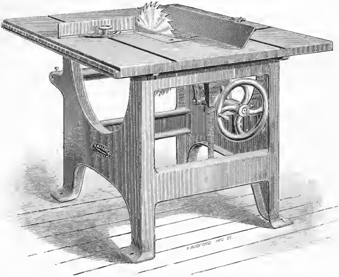
It will save nearly one half the time, as both ends are cut at one operation.

It can be changed from one length to another inside of 30 seconds.

It can be used as a single cut-off saw for any length lumber, by simply raising the back of the carriage and removing one saw.

It will slit any width up to 30 inches wide, and cut mitres on any angle.

It is simple in construction, adjustable in every feature, the workmanship first-class in all respects, made in the most substantial manner, and will give ***entire satisfaction***. Net weight 1,200.


F.H.CLEMENT
ROCHESTER N.Y.
A MUGFORD HFD CT.

No. 2 Combination Saw-Bench.

This is a fine new design, embodying all the conveniences and attachments required in such a tool.

The Frame is cast in one piece, and is strong and massive. It stands 30 x 36 inches on the floor, and 33 inches high to top of table.

The Table is all iron and is 38 x 50 inches, with suitable grooves for the gauges. It is firmly bolted to the frame and has a central throat 6 x 20 inches, filled with a separate iron plate slotted for the saw. By this means saws can be changed easily, and dado heads or other cutters attached to the saw arbor. A finger hole in the plate makes it easy to remove.

The Arbor is of steel 1½ inches in diameter, and is ordinarily fitted to receive saws with 1¼ inch hole, but this may be varied to order. The pulley is 4½ x 6 inches, and the bearings are long, nicely scraped and fitted, and have ample provision for oiling. The arbor frame swings on trunions at the rear; is raised and lowered by the screw and hand wheel shown, and is guided at the forward end in a way. These parts are thus very rigid, and will not spring or vibrate.

Three Gauges are provided; one slitting gauge arranged to tilt to 45 degrees or less for bevel sawing; one adjustable and one stationary cut-off gauge, which may be connected by a bar for cutting long stuff and fine jointing.

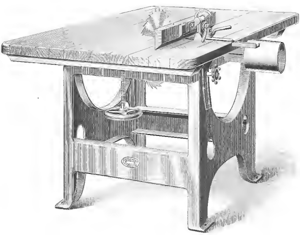
A Boring Attachment is furnished when ordered, consisting of a bit socket on the outer end of the arbor, a sliding table having a vertical adjustment by a screw and crank, and suitable stops and gauges. Both sets of V slides have adjustable gibs to take up wear.

A Counter-shaft is provided unless otherwise stipulated, and it should be located on the floor about five feet from the center of the arbor. The tight and loose pulleys are 10 inches x 5¼ inches, and should run for a 14 or 16 inch saw, 600 per minute. The table throat will receive a 20 inch saw or a cutter-head 4 to 5 inches wide, and a 10 inch saw will project 1¾ inches through the table.

One 16 inch saw is furnished with the machine.

Horse power required, 2 to 3. Shipping weight, with counter-shaft, 1000 lbs.

This also makes an excellent jobbing machine, with boring attachment and special cutter heads, which can be furnished when ordered.



IRON FRAME SLITTING SAW-BENCH.

This is a heavy, well proportioned machine with large arbor and driving pulley, and is intended for splitting rough lumber up to 6 inches thick, in all kinds of wood-working shops.

THE FRAME is cast in one piece, planed level on top and the arbor yoke is heavily ribbed and firmly bolted in, so as to avoid vibration of the saw.

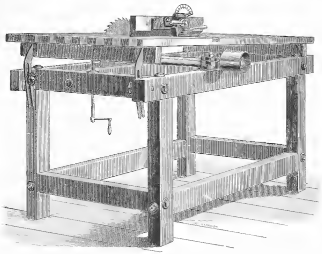
THE ARBOR is steel 1 3-8 inches diameter, and the driving pulley is usually 5x6 inches unless otherwise ordered; the boxes are extra long and nicely scraped to the journals, and are self-oiling.

THE TABLE is of kiln-dried cherry glued up in strips, 38x60 inches surface, and is hinged at the back of frame and is adjustable by a raising screw and held by clamping segments at both sides, which are tightened by one wheel.

THE RIPPING GAUGE adjusts in an iron dovetailed way let into the table, and is also adjustable to slit at any angle from square to miter and is provided with an index.

SAWS may be used 20 inches diameter if necessary, and an 18 inch saw is usually sent with machine.

COUNTER-SHAFT to order. By the addition of a cut-off gauge and iron way let into the table, this makes a good general Saw Bench for any kind of work. Saws 12 inches diameter, project 2 1-2 inches above the table. Shipping weight about 500 lbs., without counter-shaft.



IMPROVED HARD WOOD SAW-BENCHES.

The frame work of these machines is made of black birch and rock maple, thoroughly seasoned and kiln-dried. The tops or beds are glued up of narrow strips and so cleated that they cannot warp or split.

Each machine is furnished with a self-oiling, steel arbor, with pulley between the bearings or outside, as may be preferred. Also, with the "patent combination saw gauge," which is the most perfect tool of the kind in the market. It can be changed from a square to a bevel gauge in a second, and will save sufficient time in a year, to more than pay for itself.

These tables are made in five sizes as follows, viz.:

No. 1 table is 2 feet 7 inches wide, 3 feet 10 inches long, with No. 1 Arbor, for 12 inch saws or less, with ⅞ inch hole. Arbor 1 inch diameter.

No. 2 table is 2 feet 9½ inches wide, 4 feet 6 inches long, with No. 2 Arbor, for 16 inch saws or less, with 1 inch hole. Arbor 1⅛ inches diameter.

No. 3 table is 3 feet wide, 4 feet 10 inches long, with No. 3 Arbor, for 20 inch saws or less, with 1⅛ inch hole. Arbor 1¼ inch diameter.

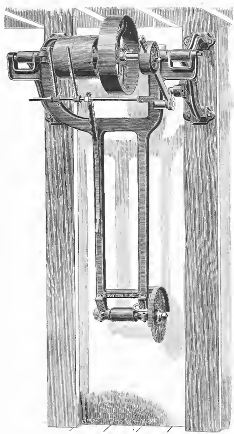
No. 4 table is 3 feet 2 inches wide, 5 feet 4 inches long, with No. 4 Arbor, for 24 inch saws or less, with 1¼ inch hole. Arbor 1⅜ inch diameter.

No. 5 table is 3 feet 5 inches wide, 5 feet 10 inches long, with No. 5 Arbor, for 30 inch saws or less, with 1⅜ inch hole. Arbor 1½ inch diameter.

Cutting-off apparatus furnished when wanted.

Saws are not furnished with these machines unless specially ordered.

I am prepared to furnish tables of special sizes when desired, at short notice.



PATENT SWINGING CUT-OFF SAW.

The necessity for this class of saws is now admitted, and when properly made they are very convenient for cross-cutting lumber. They take up little room, and are always ready for use. An opinion which prevails to some extent, that they are only intended for rough cutting, has arisen from the fact that they have not usually been made heavy enough for the work required of them; consequently, when cutting through thick stuff, the saw would twist out of line.

The cut represents a Swinging saw which differs from others in several respects. It will stand greater torsional strain without gettting out of line, and is weighted back by a new and improved device, by means of which the strain against the operator is greatly relieved. This is accomplished by pivoting the lever in such a manner that its short arm leans against a friction roller, on the frame, and as the latter is drawn forward the resistance decreases.

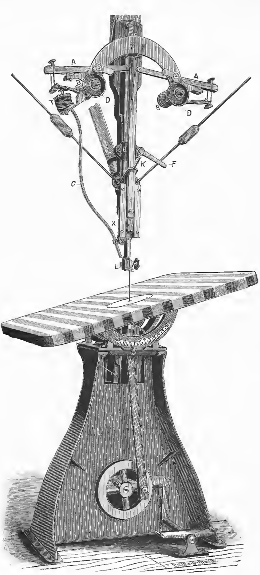
A very compact and effective belt shifter is attached to the frame, and goes with each machine, thus saving the expense of putting one up.

This machine should be suspended from uprights erected back of the bench, as shown in the cut.

The whole weight of the machine comes on the hangers, which leaves the driving shaft free from any strain, excepting the pull of the belts.

The tight and loose pulleys are ten inches in diameter, five inches face, and should run 500 revolutions per minute,

Shipping weight, 500 pounds. Horse power required, about three.



PATENT SCROLL-SAWING MACHINE.

PATENT SCROLL-SAWING MACHINE.

THESE are the most practical and durable Scroll Saws now made. Nos. 1 and 2 frames are cast in one piece, and No. 1 table tilts to an angle. The tension springs are very strong and elastic, and so arranged that their movement at each stroke of the saw is very slight. They have been run constantly for nine years without giving out or showing weakness.

A FRICTION PULLEY and brake is attached to the crank-shaft in such a manner that the saw can be stopped and started instantly. By this improvement, the blade can be stopped, removed, replaced and started at full speed in less than four seconds. A self-acting clamp holds the lower end of the blade so that when the latter is broken it can be used again.

ALL SIZES of these machines have an air pump and tube for blowing away saw-dust, and there are steel guides for the blade over the work, which are adjustable for different widths of blade and thicknesses of the work. The tables of Nos. 1 and 2 are 38x40 inches, and of Nos. 3 and 4, 36x38 inches, 1 3-4 inches thick of alternate strips of ash and walnut, securely fastened to heavy iron ribs to prevent warping.

THE FRAME of No. 3 Machine is all iron and bolted together, being lighter than No. 2; and in No. 4 machine the uprights or legs are rock maple bolted up to iron spiders.

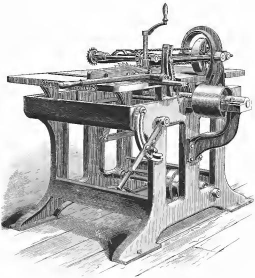
THE LOWER GUIDE-WAYS are so constructed that their expansion and contraction by heating and cooling, does not affect the cross-head, but the latter is always snug in its bearings. The straining-head is adjustable for different lengths of blades, and it is counter-balanced so as to be easily set for any length of blade.

ALL SIZES are fully guaranteed to give satisfaction on fair trial. A complete set of blades sent with each Machine.

BLADES from 12 to 24 inches long may be used, 1-8 to 3-4 inch wide, cutting up to 10 inches deep.

Diameter of driving pulleys, 8 3-4 inches; speed per minute, 850.

☞Over 5,000 of these machines are in use.



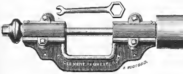
NO. 1 IMPROVED SPUR FEED SLITTING SAW-BENCH.

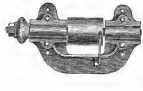
This is a strong, compact and durable machine, and has several new features embodied in its construction that will entitle it to the consideration of all practical men.

The Table has a perpendicular movement of five inches and always presents a level surface to the work. This is accomplished by a peculiar device found on no other machine. The shifting of the guide is accomplished by simply raising the lever a trifle, moving the guide to the required position, and then dropping the lever, it will lock itself automatically. By the use of this device the operator can set to any width without the use of a screw, which cannot be done on other machines.

The Spur Feed-Wheel is driven with link belt. This gives a positive feed, and prevents all slipping of belts. I will substitute leather belting for the chain if purchasers prefer it. The operator can start and stop the feed at will. The saw can be taken off without raising the table.

The Arbor is of steel, 1⅞ inches in diameter, and is held in place by three heavy self-oiling boxes. The table is of wood and iron combined and is strong in construction. The saw is 20 inches in diameter. There are three changes of feed, 50, 90 and 150 lineal feet per minute. The pulley on arbor is 8 inches in diameter, 8½ inch face, and should make 2,000 revolutions per minute. The No. 2 machine is similar in design and construction, with the exception of the table which is hinged. The pulley on the No. 2 machine is 6x6 inches, and should make 2,500 revolutions per minute.





STEEL SAW ARBORS.

These Arbors are made from improved designs, having rigidly connected boxes, long bearings, heavy collars, self-oiling arrangements, and hold-fast attached to frame. Large wicks carry the oil directly to the journal, from whence it is returned at the ends of the latter. Everything is accessible and easily cleaned, adjusted and replaced, there being no crooked oil-channels to clog up, as in many so-called "first-class" arbors. The boxes are lined with a fine quality of metal, the spindle is of steel, finely fitted, and there is provision for taking up the end motion without re-babbitting the boxes. Bottom of yoke is planed off true

The Pulley can be located either inside or outside of the boxes, as ordered, so as to bring the belt away from the work, but the central position is the better one for wear.

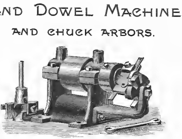
DIMENSIONS.

NO. OF ARBOR.	1	2	3	4	5
Diameter of Arbor	1 inch.	1⅛ inches.	1¼ inches.	1⅜ inches.	1½ inches.
Diameter of Pulley	3 inches.	3½ inches.	4 inches.	4½ inches.	5 inches.
Face of Pulley	4 inches.	4½ inches.	5 inches.	5½ inches.	6½ inches.
Width of Belt	3½ inches.	4 inches.	4½ inches.	5 inches.	6 inches.
*Size of Hole in Saw	⅞ inch.	1 inch.	1⅛ inches.	1¼ inches.	1⅜ inches.
Distance between Bolt-holes	10 inches.	11½ inches.	12¾ inches.	14¼ inches.	16 inches.
Size of Saw to use	8 to 12 inches.	12 to 16 inches.	16 to 20 inches.	20 to 24 inches.	24 to 30 inches.
Speed per minute	3,000	2,500	2,000	1,600	1,250

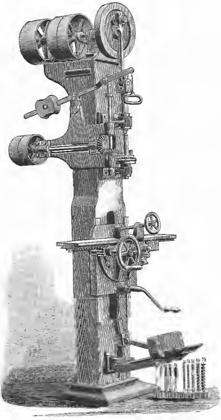
*The Arbors can be made to order for any size of hole. Self-adjusting Sleeves for different size holes are also furnished to order, at an extra price.

HAND DOWEL MACHINES,

AND CHUCK ARBORS.



These machines are made in three sizes, viz: No. 1 to turn to ⅞ inclusive; No. 2 to 1⅜, and No. 3 to 2 inches The cutter-heads are removable from the arbor, so as to change sizes, and a stick holder is provided to keep the stock from turning around. Unless otherwise ordered, 2 knives are put into each head, and they are so arranged as to cut very freely, and be readily removed for sharpening. Chucks of various shapes can also be used and will be made according to order.



NOS. 2 AND 3 PATENT MORTISING MACHINE.

These are well built, substantial machines ; the connection, spindle, straps and reverse are made of steel, with extra heavy stops on the reverse, so there is no danger of the same breaking off. The reversing arrangement is simple, positive, and not liable to get out of order.

The Improvements consist of the conical split brass boxes in which the quill and spindle runs, and the mode by which the speed of reverse is reduced to prevent the battering and breaking of the stops on the reverse, which operators know has heretofore been a bad feature on all mortising machines.

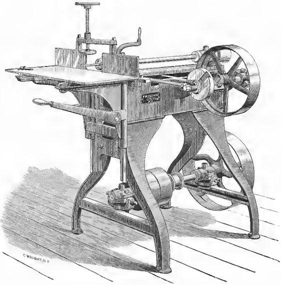
The Conical Brass Boxes are split and fitted into conical bearings The larger or quill brass has a thread cut on the lower end, with a nut on to take up the wear, and the smaller or spindle brass is held with clamp and jam nuts to take up the wear in it. The reverse is also conical, with nut on the small end for taking up the wear on same. Any mechanic will see at once that it is impossible for the spindle to be thrown out of line.

There Is No Re-babbitting needed on these machines. They will run for years without requiring repairs. All are built with tilting table, so as to be set on an angle. There is a large number of them in use throughout the country, and they are acknowledged to be the best.

The No. 2 Size is fitted with boring attachment when wanted ; the tight and loose pulleys are 12x3 inches, and should run 500 to 600. This size is intended for doors, sash, blinds, agricultural work, carriages and wagons, etc.

The No. 3 Size has tight and loose pulleys 10x3 inches and should run 500 to 600. This size is intended for sashes and blinds and other light work. Five chisels go with each machine.

Shipping weight, No. 2, 1200 pounds , No. 3, 750 pounds. All machines packed and put on cars at factory, without extra charge.



COMBINED BORING AND BIT MORTISING MACHINE,

This is a finely designed, substantial, well-made tool, adapted to the wants of any shop where boring and mortising are required

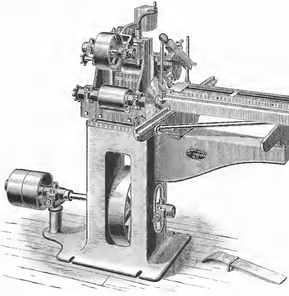
The Main Spindle is of steel and is supplied with a self-centering chuck, having hardened steel jaws, with capacity for any bit shank up to ⅝ inch in diameter. The table has a horizontal movement on ways of 6 inches, and a vertical adjustment of 9 inches by a hand-crank and screw, all the ways being provided with nicely fitted take-up gibs. There is also a stop gauge under the table to limit the depth of the cutting.

For Mortising, the hand-lever under the table is used, but for boring, it may be detached, if preferred, by removing a joint-screw. The clamp shown in the cut is used for square work, and the table is of iron, but this may be varied to order, for different classes of work.

The Crank-shaft is solidly boxed on arms projecting from the bed of the machine, the latter being cast in one piece, so that none of the parts can get out of line. The center of vibration of the main spindle is directly under the center of the pulley. The crank-pin is easy of access for adjustment, and is held absolutely rigid when set.

For Chair and other light work that has to be handled fast, I provide, in place of the above screw and table, a quick-acting, eccentric clamp, which is adjustable for different kinds of work, and clamps the stock instantaneously at either one or two points as desired; this is usually attached to a hard-wood table glued up in strips. The base of the machine is very broad and cannot tremble on a reasonably good floor. All revolving parts are carefully balanced.

The Counter-shaft is usually located on the machine, as shown, but it may be hung in hangers overhead, if so ordered. The tight and loose pulleys are 8x4¼ inches and should run about 1000 per minute. About 1½ horse power is required. Shipping weight, 650 pounds.



IMPROVED CABINET TENONING MACHINE.

One of the main features in this machine is that the cut-off saw operates first on the work, whereby the tenons are left smooth and clean at the ends, and ready to enter the mortises freely without danger of pushing the glue ahead of them. The work is all done on the forward run of the table and thus necessitates a special arrangement of the parts with reference to the driving mechanism, which cannot be had in the ordinary form of sash or door tenoners.

The Frame is cast in one piece and is compact and strong, allowing access to all parts for oiling and adjustment. The ways are bolted firmly to it and diagonally braced so as to avoid springing.

The Main Arbors are belted between the journals and are adjusted by screws on V slides which have carefully fitted gibs.

The Cutter-Heads are very carefully made and balanced, and the knives have a shear cut. The upper head has an endwise adjustment by a screw, and both heads may be raised and lowered together, or the lower one separately.

The Saw Arbor runs in a yoke frame which has an endwise adjustment of three inches on gibbed ways with screw and finger wheel. A clamp wheel on the gib prevents trembling, and insures smooth and true work. A ten inch cut-off saw is usually furnished.

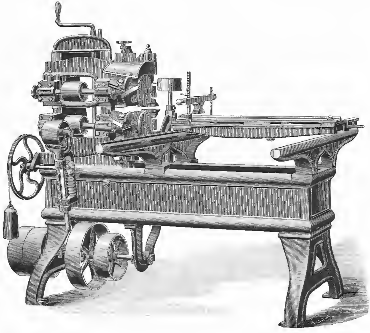
All Arbor Boxes are carefully scraped to an accurate fit on the journals, so that the machine can be started off without heating or "wearing down" to a bearing.

The Table runs on square slides with adjustable side gib, and it is also gibbed under, so that it cannot lift by the action of the lower cutter. The movement of the table is thus easy, without any slack on the ways.

The Stop Gauge is very simple and effective, and will take work from 3½ inches long and upward, and the extension bar may be made to take 6 ft. if ordered. The clamp lever is adjustable to different thicknesses and widths of work. The weighted tightener keeps a constant tension on the driving belt for any position of the cutters. As usually made, the heads cut 3 inches wide, but they can be made wider if necessary

The tight and loose pulleys are 8x3¾ inches, and should run about 800 per minute.

Shipping weight, about 850 pounds. Horse power required, about two Special cope cutters can be attached when required



No. 2 Door and Sash Tenoner.

This machine has a very substantial iron frame, and is finished in the best manner.

The Cutter-heads are made small, so that they can be run at great speed; and, by running much faster than heads on other machines, they do better work and more of it.

The Top Headstock is adjustable up and down, and in and out, and both headstocks can be moved up and down together without changing the thickness of the tenon in the least. This will be found difficult to do on any other machine. The binding arrangement is complete. It is operated by a weight, and is self-adjusting, either vertically or horizontally.

The Table is sufficiently heavy to always remain in position, but slides very easily. There is an adjustable gib bolted on the end of the table, which operates against the side of the slide. It can be tightened as the slide wears away, or loosened so that the table will slide more freely; this will be found a very useful arrangement after the slide has become worn. There is also an improved hold-down on this machine, which is very handy. The lumber is held down with it by a rtachet and catch, which operates instantly, holding the shortest pieces firmly in place. It cuts a tenon 7 inches long at one operation.

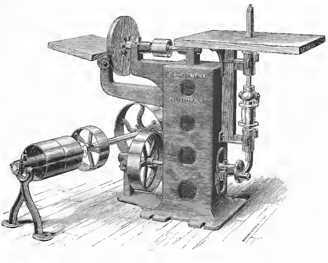
The Cut-off Attachment is adjustable to any length tenon desired (by means of a screw) without stopping, and is run with the same belt as the heads.

There are several other improvements not mentioned. In fact, this is the best Tenoning Machine in the market, and we guarantee it to give entire satisfaction.

The cutter-heads should run from 3,000 to 3,500 revolutions per minute. They have tight and loose pulleys, four-inch face, ten-inch diameter, which should run from 800 to 900 revolutions per minute.

The machine is furnished in any of the following forms:

Double heads and 2 copes; Double heads and no copes; Single heads and 2 copes; Single heads and no copes; Single heads and one cope; Cut-off saw when ordered, extra.



NEW UNIVERSAL SAND-PAPERING MACHINE.

These are indispensable tools for Cabinet, Chair, Bracket, Organ, Carpenter and Job Shops, for smoothing the edges of scrolls, brackets, and irregular pieces of all kinds, whether wholly curved or partially straight. A perfectly smooth surface is produced, ready for filler or varnish directly from the saw, and the machine will easily do the work of four or five men and save 75 per cent. of the sand-paper over hand-work, besides leaving a better and truer surface.

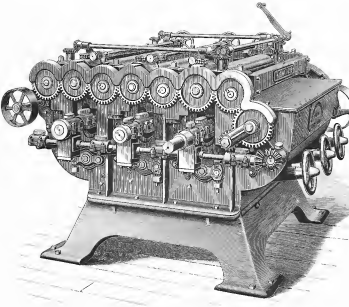
The Frame is cast in one piece, and the machine is all iron and steel, except tables, which may be of iron when ordered. The vertical spindle has a reciprocating motion (to wear the paper evenly), and is provided with an improved hard wood roll having an elastic surface, and on which sand-paper is evenly held and tightly clamped, by screwing down the nut at the top of the spindle. The disc is provided with a ring for clamping the sand-paper over the outer edge, and is usually made 21 inches in diameter. The disc and roll spindle being on opposite sides of the machine, two persons can work at the same time.

The Bearings are all extra long and lined with a fine quality of metal, with extra arrangements for oiling, and the workmanship is first-class.

Rolls may be used up to 4 inches in diameter, 3 inch and 1½ inches being the sizes usually sent; and they are usually 9 inches in length. There are iron rings in the table around the vertical spindle which may be changed for different sizes of rolls. The counter-shaft is arranged to drive all the moving parts, and has 8x4½ inch pulleys, which should run 600 to 650 per minute.

These Tools are made in three forms : No. 1, with single upright spindle and one roll ; No. 2, as in the engraving, with one disc and two rolls ; No. 3, with two vertical spindles and two rolls of different sizes, but without disc.

Shipping weight, No, 1, 500 ; No. 2, 650 ; No. 3. 800 pounds. Iron tables extra.



IMPROVED PATENT 3 DRUM SANDER.

There are Three Sand Cylinders; The first, Cutting; second, Finishing; third, Polishing; each are independently adjustable, while running or idle, to any desired cut by simply turning hand-wheels which are directly in front of machine. The two first are ordinary size, covered with a new kind of packing, which is very uniform and durable. The last is smaller, being only 9 inches in diameter, revolving much faster than the others, with a very soft, fine cushion for the paper, which just touches the work and imparts a very high polish.

The Paper Fastener dispenses entirely with screws and bolts for fastening the paper to the drums, using a device simple and positive, with provision for taking up the stretch which will occur. Every user will agree that the firmness with which paper is held determines its life. This feature alone is worth half the cost of the machine, and is one which no other manufacturer possesses.

We Guarantee to put the sand-paper on the drums in one-third the time heretofore required, and to save 25 per cent. of sand-paper over other machines; some manufacturers say one-half.

Forty-Inch Paper covers either first or second cylinders, while 30 inch paper covers the smaller, consequently there is no trouble to clothe Invincibles to any width, with standard sizes cut lengthwise.

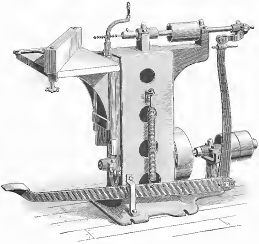
The Oscillator is simple, fast, strong, positive and durable. There is no lost motion or wear, as in all cam movements, consequently no jar or tremor to the machine. Every cylinder oscillates.

The Bed Plates are very heavy, and are supported intermediately, making it impossible to break them, or drum the stock

The Frame is compact and strong, and the whole machine is much heavier than any other now made. Every part is adjusted by screws, and provision is made at all necessary points for taking up wear. "Lagging" and "Shimming up" are unnecessary.

SCHEDULE.

SIZE OF MACHINE.	SIZE OF T. & L PULLEYS.	SPEED OF COUNTER.	FLOOR ROOM REQUIRED.	SHIPPING WEIGHT.
24 inch	14 x 8	550	5 ft. x 5½ ft.	4700
30 inch.	14 x 8	550	5 ft x 6 ft.	5000
36 inch.	14 x 8	500	5 ft x 6½ ft.	5400
42 inch.	14 x 8	500	5 ft. x 7 ft.	5900
48 inch.	16 x 10	500	5 ft x 7½ ft.	6400



No. 1 HORIZONTAL BORING MACHINE.

This is the neatest and most practical design for light work in the market.

THE FRAME is cored out hollow, and is cast in one piece. The Spindle is of steel, and has a long-faced pulley driven from the counter-shaft, by means of which holes may be bored 4 1-2 inches deep or less. The Table is of hard wood glued up, 14x28 inches, and has a stop bar which is adjustable to any angle, and held by suitable clamps. The vertical adjustment is by a screw and hand-crank, with a range of 10 inches. The hand-crank is removable when desired.

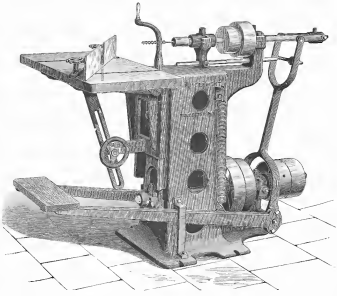
THE SPINDLE has bronze end bearing, and all bearings are well proportioned and lined with a fine quality of babbitt metal. The foot-lever and returning springs are designed for quick and easy operation; and there is no downward pull on the rear end of the Spindle, as in many so-called "first-class" machines. A stop for regulating the depth of the hole is provided under the main spindle, the same as No. 2 Borer. All the parts are nicely fitted.

THE COUNTER-SHAFT has tight and loose pulleys, 7 inches in diameter and 3 1-4 face, and should run about 1,000 per minute. The loose pulley is self-oiling, and has a hub 5 inches long.

Shipping weight, 500 pounds.

About 3-4 of one horse power is required.

Little Giant Bit Chucks extra.



No. 2 HORIZONTAL BORING MACHINE.

This machine has many advantages not found in other makes. It is all iron and steel (except the treadle-bar), the frame is cast in one piece and is very strong and rigid and carefully designed with reference to proportion and convenience.

The Boring Arbor is of steel, 1¼ inches in diameter, and is splined in a steel sleeve which runs in a very long bearing of fine babbitt metal, thus all the journals on the boring arbor are of steel. The stroke or depth to which the arbor bores is 9 inches.

A Steady Bearing is placed next the bit socket so that the wear can be readily taken up and the bit prevented from dodging as it enters the work; this is a great improvement on the usual method of sliding the spindle through a quill or sleeve, the wear in which cannot be compensated.

The Vertical Lever pulls directly on the center line of the spindle and not with a downward bent link as in most so-called "first-class" machines. This improvement speaks for itself.

The Table, when of iron, is made 18 x 32 inches surface and has slots for the fence at right angles so that long work can be bored endwise as well as across, at any required angle. The table tilts to 45 degrees both ways and the fence is adjustable in all directions to the same angle or less. Numerous holes are provided in the table and fence for the attachment of jigs or stops.

The Stop Gauge is easily reached by the operator at his post and can be adjusted without stopping the machine.

The Foot Lever is arranged to give a good leverage on the boring arbor, and there is a returning spring on each side of the frame to equalize the action. This arrangement gives a quicker and easier movement than a counter-weight, and the springs being very long in proportion to the required expansion, are practically indestructible. The tension may be adjusted when necessary.

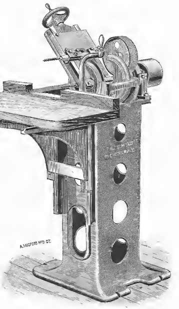
The Table Bracket has a vertical adjustment of 12 inches and is carefully fitted to the ways with an adjustable gib; the screw-crank is removable.

The Counter-Shaft has tight and loose pulleys 8 x 3¾ inches and should run 900 to 1000 per minute

About one-horse power is required. Shipping weight 600 to 700 pounds.

Self-centering chucks of various sizes, extra.

When wanted, a wood table similar to that on No. 1 Borer, will be furnished at a corresponding reduction.


A.MUGFORD MFG CT.

DOUBLE HORIZONTAL BORING MACHINE.

(WITH ANGULAR ADJUSTMENT.)

FOOT LEVER MOVEMENT FOR TABLE, NOT SHOWN.

This a finely designed and carefully made Machine in every respect. It is intended for that class of work in which two holes are to be bored at the same time, as in doweling, chair, cabinet, carriage, car, and other similar work.

The Frame is cast in one piece, and is strong and well proportioned.

The Two Spindles are mounted in an adjustable head which swivels around one of them, so that they may be set at any angle from the horizontal line of the table, as shown in the cut. The range of adjustment is from a horizontal to a perpendicular line, and beyond the perpendicular. The distance between the centers can be from 1 inch to 10 inches, and this adjustment is made with a screw on a gibbed slide independently of the angular adjustment in any position.

The Table has a vertical movement on gibbed ways of 10 inches, and a forward and back movement also on gibbed ways of 6 inches. When so ordered, it may also have a longitudinal movement for mortising, as in some kinds of chair work.

The Intermediate Gear is mounted on a radius arm, so that it always retains an even mesh with the central spindle. By slacking a nut the gear may be thrown out of mesh with both spindles so that a single spindle may be used at any time without running the gearing. Both gear and pinions are very carefully cut and matched together, so that they run without back-lash or rattle.

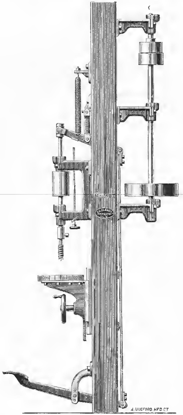
The Spindles are of steel, and the bearings are carefully scraped and fitted, so that the machine will start off cool from the first The proportion of length of bearing to diameter is 4½ to 1.

The Adjustment Screw for the table is now worked by a crank under the table, making it more convenient than the arrangement shown in the cut.

The Counter-shaft is preferably located overhead, directly above the machine, so as to equalize the wear on the boxes, but when ordered, it can be put on the frame. The tight and loose pulleys are 8 x 3¾ inches, and they should run about 500 per minute.

One pair of bits is furnished with the Machine. and extras to order. Shipping weight, 600 pounds. Power required, about 1 horse.

☞ A foot lever attachment is now applied to the table movement, so that the operator has the use of both hands for the work.



No. 2 Vertical Boring Machine.

The large sale of this machine in the past few years, and the general satisfaction it has given, have induced me to remodel the patterns and add several improvements without increasing the price.

The Spindle is of steel, and has hard bronze friction collars for the lever sleeve. It hangs 9 inches from the post, and will bore 5 inches deep or less. The boxes in which it moves are longer than the entire vertical movement, so that the wear is very even and is reduced to the lowest possible point. These boxes are cast together in a hollow or cored yoke which is thus strong and rigid.

The Table Bracket has a screw adjustment of 12 inches on the slide, and there is ample provision for taking up the wear. The table is usually of hard wood, glued up 14x28 inches, but will be made of iron when wanted, at a slight extra charge.

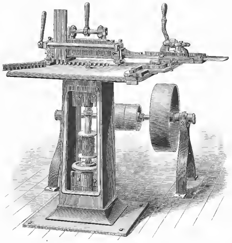
The Depth Gauge or Stop is threaded for adjustment, and is made fast with a set-screw, and between the gauge and the work there is only one joint, so there is no lost motion on the bit.

Notice the Advantages of the method of balancing the spindle and pulley, by means of the heavy bar connecting the foot lever with the balance lever; the retracting spring has only to overcome the friction of the parts, and as a consequence, the labor on the operator's foot is very light, and the motion can be very quick, thereby increasing the capacity of the machine considerably. For these reasons and the care used in fitting the parts, as well as the general convenience of the adjustments, I claim that this machine has no equal of its kind in the market.

The Counter-shaft has three bearings, and is usually six feet long. The tight and loose pulleys are 7x3½ inches, and should run about 900 to 1000 per minute. The post is usually 8x8 inches, and 12 feet long, glued up.

Little Giant Chucks can be attached to the spindle without fitting, and will be furnished when wanted at the cost of the chuck extra.

Shipping weight about 500 pounds.



PATENT INDEPENDENT DOVETAILER.

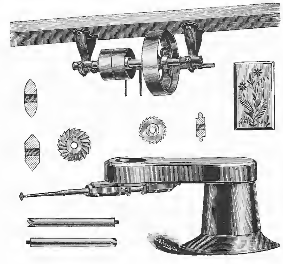
This is a finely constructed and efficient machine, and is the most successful and generally used tool of the kind now made.

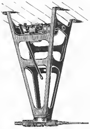
The Frame is a solid casting; the top is of iron, 30 inches square; the clamps take 13 inches wide and from ¼ to 1½ inches thick; it cuts both front and side of drawer at once; the spindle has a vertical adjustment.

All Parts are nicely fitted and convenient, and the machine is fully guaranteed to be as represented and satisfactory.

With each Machine are furnished: counter-shaft with T. and L. pulleys 6x3 inches, speed 850; one chuck or socket, and 3 No. 70 cutters.

Shipping weight, 700 pounds. Horse-power required, about 1.





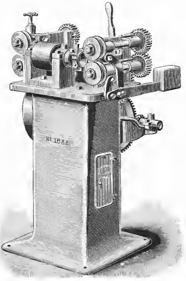
PATENT CARVING MACHINE.

These machines are designed for furniture manufacturers, organ builders, and all other cabinet makers who desire to beautifully ornament their goods and reduce the cost of doing so by hand. The improvement to which we would call special attention on the bench machine consists in its having the bottom part of box on the upper side, so that the belt always pulls into the box instead of upon the cap. These boxes are made on a yoke which is turned and fitted to the under side of the overhanging arm of machine, thus enabling the operator to turn the spindle in any direction he may desire to accommodate his work. When turned out straight, it gives a very large range, being thirty six inches from cutter to base. By having the caps bolt up from the under side the operator is enabled to hold his work up square, as cap projects down no further than diameter of cutter. The caps are planed on to the bottom part of the box, thus insuring perfect solidity; the front one is seven inches in length and back one is provided with heater and step-screw so that all end motion or vibration is avoided. The Spindle and Pulley are made of one solid piece of steel, Pulley having wide lips and filling between boxes in yoke.

This machine is heavier and stronger than any light Carver ever produced, and is capable of being run at a higher rate of speed, thus performing its work in a smoother manner. Ten Cutters accompany each machine, as shown in Cut, carving any variety of wood, and special Cutters for any design will be furnished when wanted. There are a large number of these machines in operation, and many testimonials from parties using them. Samples of work will be sent on application.

The Counter has 6 inch tight and loose pulleys and should run 1,100 per minute.

The suspended machine shown in the smaller engraving is preferred by many, and is made in substantially the same way as the other, except that the spindle does not swivel. This can be made with cutters on both ends of the spindle if required.



IMPROVED ROD AND DOWEL MACHINE.

The Engraving shows a fine first-class Rod or Dowel Machine, embodying many improvements, and thoroughly designed and built in every detail. The frame is cast in one piece and is provided with a tool closet.

The Main Arbor is of hammered steel bored out, and the bearings are genuine babbitt metal carefully scraped and fitted. The diameter of the journal is thus reduced as much as possible, and every precaution taken against heating, even at very high speeds.

The Feed Works consist of two pairs of rollers, all driven, and provided with extra heavy gearing; the feeding-in rolls are self-centering and heavily counter weighted; they will thus accommodate large variations in the rough stock without wedging or stopping the feed. The feeding-out rolls are grooved in pairs to nicely fit the stick after turning, and ample pressure is applied to them by a strong spring which is adjustable by a hand wheel. All the rolls can be removed in a few seconds.

There are Three Speeds on the feed cones and the gearing is reversible by means of a hand lever, so as to feed out bad stock. All these parts are extra strong and carefully fitted.

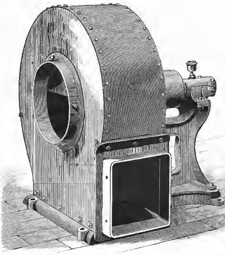
The Cutter-Heads are threaded into the arbor and have two knives made so as to cut as near as possible with the grain. They are fastened by steel clips and hardened screws.

An Overhead Counter-shaft is furnished, with adjustable hangers, self-oiling loose pulley and feed cone to match the cone on the machine. No pains has been spared to make these tools reliable in every particular, and there are no "traps" or parts of doubtful utility in them.

Two Cutter-heads and 8 (2 sets) Feed Rolls are furnished with each machine, and are included in the price. Three sizes are made, and the largest or No. 3, has 3 sets (12) of feed rolls for large stock.

SCHEDULE OF DIMENSIONS.

NUMBER OF MACHINE.	TURNS TO	SPEED OF HEAD.	SHORTEST LENGTH TURNED	SIZE OF ARBOR PULLEY.	SPEED OF COUNTER-SHAFT.	TIGHT AND LOOSE PULLEYS	SHIPPING WEIGHT.
No. 1	1¼ inches.	4500 to 5000	16 inches.	4½ x 4½ inches.	1000 to 1100	8 x 4½ inches.	700
No. 2	1½ inches.	4000 to 4500	18 inches	5 x 5½ inches.	1000 to 1100	10 x 5¼ inches	900
No. 3	2 inches.	3600 to 4000	20 inches.	6 x 5½ inches	900 to 1000	10 x 6¼ inches.	1000



PLANING MILL EXHAUST FAN.

The cut represents a new style Exhauster with shell made wholly of steel plate, and journal bearings bolted to the base instead of the overhanging arm bolted to the side of the shell. It will thus be seen that should any blocks or heavy material pass through the fan, the shock and vibration of the shell is not transmitted to the journals, besides making a much neater, lighter, and more durable machine in every way.

The blast wheels of these Exhausters are made wholly of sheet and cast-steel, making a much lighter, stronger and durable wheel than the old style commonly used with the iron arms cast in heavy cast-iron hubs.

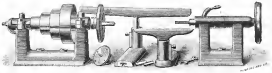
The diameters of shafts and lengths of bearings have been increased, giving long, heavy journals, as will be seen by reference to tables of sizes, etc. The journals are all hardened after being turned, and then ground accurately to standard gauge.

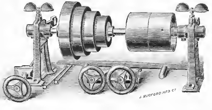
SINGLE EXHAUST FANS.

No.	Height of Machine	Diam. of Inlet	Size of Outlet	Diam. of Pulley	Face of Pulley	Diam. of Shaft	Length of Bearing
15	31	10¾	9 9/16 x 9 9/16	6	5	1½	6¾
16	38	13	11¼ x 11¼	7	6	1⅝	7½
17	43	15	13½ x 13½	8	7	1¾	7⅞
18	52	18	16¼ x 16¼	10	8	1⅞	8⅜
19	56	20	18 x 18	11	9	2⅛	9½
20	66	24	21½ x 21½	12	10	2¼	10⅛

DOUBLE EXHAUST FANS.

No.	Height of Machine	Diam. of Inlet	Size of Outlet	Diam. of Pulley.	Face of Pulley	Diam. of Shaft	Length of Bearing
22	31	10¾	9 9/16 x 9 9/16	8	7	1½	6¾
23	38	13	11¼ x 11¼	9	8	1⅝	7½
24	43	15	13½ x 13½	10	9	1¾	7⅞
25	52	18	16¼ x 16¼	12	10	1⅞	8⅜
26	56	20	18 x 18	13	11	2⅛	9½
27	66	24	21½ x 21½	14	12	2¼	10⅛





IMPROVED WOOD LATHES.

These tools are manufactured from new designs, embodying all the advantages that are usually found in first-class hand lathes. The head and foot stocks are cored hollow and made heavy and rigid, so as to resist vibration or "chatter." The head and tail spindles and all centers are of steel; The tail screw has square threads, and the hand wheel is turned and polished.

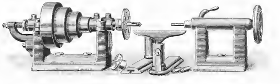
The Main Bearing Caps are planed into ledges on the head-stock and lined with fine babbitt, which is carefully scraped and the journals nicely fitted, so as not to heat when started. All surfaces resting on the bed are planed true and do not require fitting down if the bed is true.

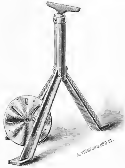
The Head Stock Cone is of iron, specially strengthened inside but quite light, and it can be reversed to bring the small lift next the head center. The counter-shaft has kiln-dried cherry cone glued up in layers with grain crossed, and it is fastened at both ends to the shaft.

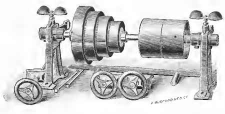
The Parts usually furnished are Head and Tail Stocks, one pair Wood Centers, Rosette Chuck, Face Plate, 2 Rest Sockets, 3 T Rests, Counter-shaft and Hangers, and Clamp Bolts with hand wheels for bed 10 to 12 inches deep.

SCHEDULE OF DIMENSIONS.

SWING.	DIAMETER HEAD SPINDLE.	LENGTH JOURNAL.	WIDTH CONE BELT	TIGHT AND LOOSE PULLEYS.	SPEED OF COUNTER-SHAFT.	SHIPPING WEIGHT. (NO BED)
12 inches.	1¼ inches.	4 inches	1¾ inches.	7 x 3½ inches.	600 to 700	280
16 inches.	1½ inches	5½ inches	2 inches.	8 x 3¾ inches	600 to 700	420
20 inches.	1¾ inches	6 inches	2½ inches.	9 x 4¼ inches.	600 to 700	550




A. MUGFORD NFD CT.


A. MUGFORD NFD CT.

IMPROVED PATTERN MAKERS' LATHES.

These tools are manufactured from new designs, embodying many advantages not usually found in such lathes. The head and foot stocks are cored hollow and made heavy and rigid so as to resist vibration or "chatter." The head and tail spindles and all centers are of steel; the tail screw has square threads, and the hand wheel is turned and polished.

The Main Bearing Caps are planed into ledges on the head-stock and lined with fine babbitt, which is carefully scraped, and the journals nicely fitted, so as not to heat when started. All surfaces resting on the bed are planed true, and do not require fitting down if the bed is true.

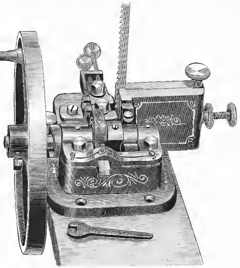
The Head Stock Cone is of iron, especially strengthened inside but quite light, and it can be reversed, when ordered, to bring the large lift next the head center. The counter-shaft has kiln-dried cherry cone, glued up in layers with grain crossed, and it is fastened at both ends to the shaft.

The Main Arbor extends at both ends with reversed threads, as usual, and there is a detachable yoke to take the end thrust, provided with bronze step and a hardened steel center pin. A large face plate for the overhanging end of the arbor and a heavy floor rest stand, shown in separate engraving, are furnished.

The Parts usually furnished are Head and Tail Stocks, one pair Wood Centers, one pair of Conical Centers, Rosette Chuck, 2 Face Plates, 2 Rest Sockets, 3 T Rests, Counter-shaft and Hangers, Floor Rest Stand, and Clamp bolts with Hand Wheels for bed 12 inches deep.

SCHEDULE OF DIMENSIONS.

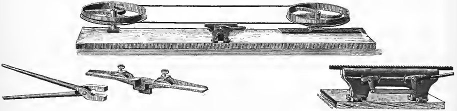
SWING.	DIAM. HEAD SPINDLE.	LENGTH JOURNAL	WIDTH CONE BELT	TIGHT AND LOOSE PULLEYS	SPEED OF COUNTER SHAFT.	SHIPPING WEIGHT. (NO BED.)
16 inches.	1½ inches.	5½ inches.	2 inches.	8 x 3¾ inches.	600 to 700	550
20 inches.	1¾ inches	6 inches.	2½ inches.	9 x 4¼ inches.	600 to 700	720
24 inches.	2 inches.	6 inches.	3 inches.	10 x 4½ inches.	600 to 700	850



PATENT BAND-SAW SETTING MACHINE.

The engraving represents a new Band-Saw Setting Machine. It is designed and constructed upon entirely new principles, and embodies all the good features of hand-work in combination with the speed and regularity of machine work.

The users of Band-Saws have long felt the need of a machine that would hold a narrow saw in a rigid position and set the teeth without straining the blade; and in response to the inquiries from many leading manufacturers, a machine has been perfected that will set the teeth of any Band-Saw without in any manner affecting the blade. It is arranged to work by an easy, uniform crank motion, and when the tooth to be set is fed into position, the blade is firmly locked between the steel jaws of a vise, and remains immovable while the tooth is set to any degree required. As the crank goes forward the blade is released, when the next tooth is fed up to the dies, the blade again locked in the vise, and this tooth set in the opposite direction. All the movements are automatic, and can be carried on at a speed of 300 teeth per minute. The feeder *picks up only the tooth that is to be set*, consequently each tooth is fed to its proper position, *regardless of their irregularity*. No further expense is required outside of the machine, as the blade is simply hung up over the machine on a wooden bracket, and the lower part left pendent near the floor.



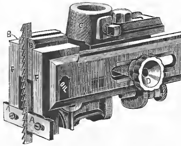
BAND-SAW APPARATUS.

FILING WHEELS AND STUDS.

Of appliances for keeping saws in order, I have Filing Wheels and Studs, shown in above cut; two sizes of Filing Vises; Brazing and Scarfing Frame and Tongs.

The first tool is made plain and serviceable, and is designed to be attached to a bench, as indicated in cut. The wheels are covered with heavy canvas, and one adjusts horizontally to strain the blade. Either of the vises may be used with the above—the small one shown in the cut having jaws 10 inches long, and the large one shown in separate cut having 18-inch jaws. There are adjustable stops in both these vises, so that the blade will not sink when being filed. They are planed true in the jaws, and will grip the blade the whole length of the vise.

I do not furnish the planks to which these tools are shown as attached, unless ordered as an extra.



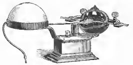
STRIEGEL'S PATENT ADJUSTABLE BAND-SAW GUIDE

WITH HARDENED STEEL ROLLER.

This Guide has a cast-steel hardened wheel with ball-bearings, which prevents friction on the back edge of the saw.

A A and B B are sectional cast-steel hardened jaws, which can be easily re-adjusted, when they become worn, by unscrewing the small screws on the inside of jaws B B and on the lower jaws A A. When worn out they can be replaced at small cost. C is a reversible socket whereby the Guide is adjusted to the guide-bar of the machine. D is the thumb-screw which releases slides F F, allowing them to be moved simultaneously either forward or back to accommodate different widths of saws. Thumb-screw E is for adjusting to the different thicknesses of saws. This Guide can be adjusted to any width of saw from 1-16 to 1 1-2 inches wide, no matter what the thickness is, in a few seconds.

The advantages obtained in this Guide, are its ready adjustability ; the side support to the blade above and below the steel back support, thus guiding the blade perfectly , and the hardened ball bearings on the back support roller, whereby it is easily started and kept in motion.

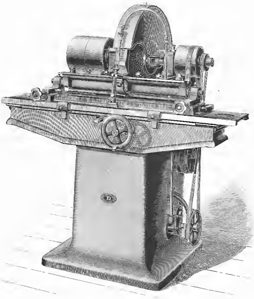


LITTLE GIANT BRAZING LAMP AND FORGE.

This is a very convenient apparatus for joining saws ¾ inch wide or less. The heat is obtained by means of a kerosene blow-pipe operating on charcoal, over which the blade is held by clamps It is very simple and easily operated, and a blade can be joined in about one-half the time required with tongs. The apparatus can be set or arranged for use at any convenient point in the factory. Directions for operating accompany each machine.

LITTLE GIANT BAND-SAW SET.

This little machine is designed to be clamped directly to the band-saw table, and the blade is fed through it while on the wheels of the machine. It is simple and durable, and easily operated, and all parts are adjustable for different widths of blades up to 1¼ inches, and for different thicknesses and length of tooth. Directions accompany each machine



IMPROVED AUTOMATIC KNIFE GRINDER.

The machine shown is designed to grind knives or other work thirty inches long. It has automatic power feed. The angle iron upon which the knife or work to be ground is held, is arranged with slot provided so that the emery wheel will grind directly towards the edge of the knife. The angle iron can be reversed and the knife ground towards the butt or away from the edge. The table or platen upon which the angle iron (holding the knife) is held, brings the work to the wheel, by small hand screw wheels at each end of the platen. The arrangement is such that when both ends of the work to be ground touch the wheel and supposed to be parallel, then to keep and retain the work in its parallel lines, the operator brings the emery wheel forward by the larger hand wheel directly in front of machine.

The Center of the Knife Bar is encircled by a split yoke. Loosen the yoke screw and you can swivel angle iron in any desired position or pitch to the wheel. Long bearings are an especial feature of the machine, with every provision known in our experience for excluding the emery dust. The platen or table is exceptionly wide, furnished with extra width of ways to traverse upon. The machine is made with tight and loose pulley, or single pulley and counter-shaft.

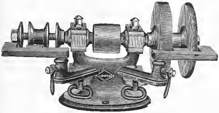
The Water Hood is so arranged that all water is distributed directly on the wheel in front of knife or cutters being ground, and this prevents drawing the temper. The inside Hood leads all the water and spray directly back to tank, which has our patent Syphon arrangement connecting with the lower tank. This device avoids depositing the grit and sediment which fall in upon tank from wheel in lower tank, and does not therefore get in the pump to clog the pipe and wear out the valves.

No Water will pass outside the Hood or from the wheel in any manner beyond the table, which is so arranged that it does not stand on the machine. The pump is made entirely of brass upon a new and improved principle, being compact, well made, and non-corrosive.

Speed of grinding Arbor, 225 per minute. Size of base on floor, 24 x 24. Height from floor to centre of spindle, 38 inches.

26 inch Knife Grinder, including Wheel and with tight and loose pulley, weight 1000 pounds.
30 " " " " " " " " " 1100 "
36 " " " " " " " " " 1200 "
50 " " " " " " " " " 1500 "
60 " " " " " " " " " 2000 "

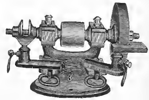
Counter-shaft extra when required.



FOUR-WHEEL GRINDING MACHINE.

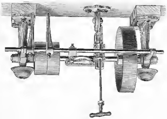
3-4 INCH SPINDLE

WILL RUN FOUR WHEELS 9 INCHES DIAMETER



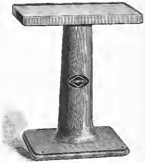
GRINDING MACHINE, No. 3.

WILL RUN TWO WHEELS 9 INCHES DIAMETER.



REGULAR COUNTER-SHAFT, No. 1.

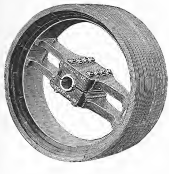
WITH PATENT BELT SHIFTER ATTACHED.

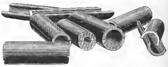


IRON COLUMN.

EMERY GRINDING MACHINES.

These are invaluable in every wood shop for grinding knives and cutters of various kinds. They are all finely designed and thoroughly made, and give good satisfaction in all cases. Wheels can be furnished of any shape or diameter within the capacity of the machine.





PATENT INDEPENDENCE WOOD SPLIT PULLEYS.

This pulley is already so well known and its merits so thoroughly appreciated, that a minute description seems unnecessary. They are all very carefully made from the best kiln-dried material, and are well protected by paint and shellac from the atmosphere. Among the advantages they possess are the following :

First.—They are all split pulleys and are perfectly balanced.

Second.—They weigh only one-third as much as cast-iron pulleys of the same size and strength

Third.—They will transmit 30 to 50 per cent. more power than iron under the same belt tension.

Fourth.—They are secured by compression, and do not mar or spring the shaft.

Fifth.—They can be changed from one size of shaft to another by simply exchanging the bushings.

Sixth.—They can be moved on the same shaft in a few minutes without disturbing couplings or hangers.

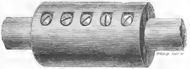
Seventh.—On account of their lightness they are much easier to handle and do not load down the bearings.

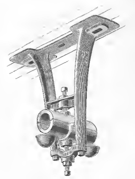
Eighth.—The net prices are as low as good iron pulleys and lower than split iron pulleys.

Ninth.—They are not only the *coming* pulley, they are already *here*, and here to stay. Many thousands are in use, and to say that they are giving excellent satisfaction, is not saying enough for them.

I carry a stock of all ordinary sizes, from 9-in. to 48-in., and a supply of extra bushings, and shall be pleased to fill orders from stock or supply extra large pulleys promptly.

In ordering, be explicit as to diameter of shaft, diameter and face of pulley, and whether straight or crowning face is wanted.





SHAFTING, HANGERS, COUPLINGS AND PULLEYS.

PATENT COLD DRAWN STEEL SHAFTING

This is a fine article fast coming into general use. It is guaranteed 30 per cent. stronger than turned shafting of the same diameter, and is true and straight and accurate to size. It is made from the best soft steel, rolled and polished by a patented process, which renders it superior to turned shafting, and equal to cold-rolled, while its net cost is less than either of these. I can furnish all ordinary sizes, and carry a stock of small. It can be key-seated without springing.

IMPROVED CLAMP COUPLINGS.

These couplings are made extra heavy and provided with clamp screws of double refined iron, rendering them safe against bursting, and all parts are carefully fitted, so that when properly put up no difficulty whatever is experienced with them. For shafts above 1 7-16 inches diameter, I provide keys, nicely fitted sidewise, which, together with the pinching of the coupling, make the strongest and most satisfactory job of the kind there is in use. A special wrench is sent with each lot for tightening the screws.

DOUBLE-BRACED ADJUSTABLE HANGERS.

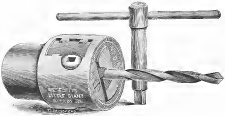
I make of these, 10, 12, 14, 15, 18, 21 and 24-inch drop, of the style shown, having both a horizontal and vertical adjustment and swiveling boxes. The latter are four diameters in length, lined with a good quality of babbitt metal and provided with oil drips. Detachable bottom yokes are provided in the larger sizes for convenience in putting in the shafting. Considering the quality, durability, design and price, these hangers have no equal. They are reversible, so as to make floor stands when required.

PULLEYS.

I am prepared to furnish iron pulleys from 3-inch face and diameter, upward. These are from modern patterns, and are fitted up in the best style by improved tools, and the prices are as low as can be obtained anywhere. For line-shafts I carry a stock of Patent Wooden Split Pulleys, which I recommend to all wood-workers. (See opposite page.)

COMPLETE COUNTER-SHAFTS.

I have 10, 12, 14 and 15-inch drop, double-braced adjustable hangers and floor stands, and furnish with them steel shafting, collars, and any ordinary sizes of iron or wood-split pulleys, for extra counter-shafts, either heavy or light. The loose pulleys are babbitted and have self-oiling tubes with caps, and they are turned smaller in diameter than the tight pulley. All hanger-boxes are divided to take up wear.



LITTLE GIANT BIT CHUCKS.

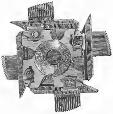
I keep a stock of these well-known chucks for bits and drills at manufacturers' prices, no charge being made for fitting them to the spindles of machines with which they are ordered. They are the best tools of the sort now made, having stood the test of several years of constant use.

They are perfectly balanced, and always bring the bit to the center. even after long wear. The jaws are of hardened steel, and the wrench and socket are also hardened The hub or boss is bored to the Morse taper and the screws and jaws are interchangeable.

No. 1 (Oneida), holds from 0 to ½ inch, and is 2¼ inches in diameter.

No. 1 (Little Giant), holds from 0 to ⅝ inch, and is 3 inches in diameter.

No. 2 (Little Giant), holds from 0 to 1 inch, and is 3½ inches in diameter.



NEW DADO AND GROOVING HEAD.

The above engraving represents a New Expansion Dado Head. This tool is especially adapted to that class of work where grooves are to be made across the grain of boards or lumber, as used for making frames, boxes and the like. All work done by it is perfect—no ragged edges, but all cleanly and smoothly cut, even under the fastest feed. It is all brass and steel, and finely fitted in every part.

The Bits can be expanded for wider grooves or contracted for a narrower groove. Each set of Bits will work nearly four times the thickness of one of said Bits ; for instance, a set of Bits half-inch wide each will make a groove one and three-eighths inches wide, or they can be set to work any intermediate width from one-half inch to one and three-eighths inches. Each head is provided with a gauge carefully fitted, which shows the position at which to fasten the Bits, and also the angle at which to file them—a convenience of no little importance.

This style of Head applies to saw mandrels, and for measure give diameter of mandrel, size of both saw mandrel collars and space between them. Also give the circle of cut the Bits should describe to suit the work on your machine.

SPECIAL TABLE MACHINERY.

I make, in addition to my regular line of work, several special machines for the manufacture of extension tables, which have proved very satisfactory in practical use.

LEG TURNING LATHE. This is the No. 3 Automatic Lathe shown on page 6, and is the only tool of the kind that can be successfully used on heavy work, especially where squares are left at any point.

DOUBLE-END UPRIGHT SHAPER FOR MOULDING "FILLING." This is a heavy, all iron machine, with two vertical spindles, one of which is adjustable, from 40 to 60 inches apart. The cutters are patent eccentric saws, so made as to have a shearing cut on the end of the grain, and thereby cut very smoothly and with little wear. The table moves on hardened steel rollers and the stock is held by suitable pressure rolls directly opposite the cut of the knives. More than double the amount of work done on an ordinary shaper can be got out with this machine, and it will be much more accurate and satisfactory. Shipping weight, with counter, 1500 lbs. Photographs.

HINGE GAINER OR KNUCKLE JOINT MACHINE. This is a heavier and more complicated machine than the shaper, but will be found equally labor-saving and probably more so. There are 3 gaining heads for the hinge plates, and 3 gouging heads for the knuckles, each set operating independently. The stock is clamped to a sliding table and is finished before removal, the table being moved a few inches only to complete the two operations. Every part is well designed and fitted, and has all necessary adjustments. Two counter-shafts go with each machine. Ordinary length takes in 48 inches long and any width. Photographs on application. Shipping weight, 1700 pounds.

TABLE-TOP DOWEL BORER. This is a three, four, or five spindled, horizontal machine with sliding table, lever feed attachment, iron bed, eccentric clamping device, steel spindles adjustable for leveling vertically, and also horizontally from 10 inches to 18 inches apart. Self-centering chucks to order. Counter-shaft furnished if required. Shipping weight, 900 pounds.

MISCELLANEOUS MACHINES.

BENCH BORER.

This is a steel arbor 1 1-4 diameter, with pulley 4 1-2 x 4 1-2 inches running in connected boxes and having an adjustable stop-rod for depth. Self-centering chucks can be attached when required, and counter-shafts furnished.

DADOING MACHINE.

This is a heavy, well-fitted and well designed grooving machine with 3, 4, 5 or more heads and with or without cut-off saw. It is all iron and steel except the table clamps, and the bearings, slides, etc., are carefully scraped and aligned. The table runs on hardened steel rollers and the transverse supporting bars may be adjusted to any point according to the position of the heads. The main arbor is steel and its boxes have a vertical adjustment of 1 inch or more. The table is gibbed under the slides so that it cannot lift. The cut is from the under side and the chips go downward. Counter-shaft is furnished when required. Shipping weight, complete machine, 1,200 pounds.

FIVE SPINDLE HORIZONTAL BORING MACHINE.

This is a first-class Gang Boring Machine with iron cored or hollow frame, steel spindles, long bearings, and ample belt arrangements. The spindles are adjustable from 2 3-8 inches apart to 36 inches from center to center of outside spindles. The table slides horizontally, with foot-lever attachment, 6 inches, and has a vertical adjustment with hand-wheel and screw of 10 inches. Both sets of ways are gibbed with take-up screws.

Two, three or five spindles can be furnished as required. Photographs and further information will be furnished on application. Self-centering chucks can be attached when required. Shipping weight, 1,200.

THREE SPINDLE BELTED BORING MACHINE,

FOR GENERAL WORK.

This is an all iron and steel machine, except the table, which may be of wood or iron as ordered. The frame is an iron column cored out and the spindles are adjustable from 3 1-2 inches to 15 inches apart or more as may be required, and the outer spindle boxes are adjustable by screw and hand wheel. The table adjusts vertically 10 inches and horizontally 6 inches, and the feed is obtained by a foot lever connection, which is adjustable for various positions of the table, leaving both hands free for handling the work. All parts are carefully fitted and a suitable counter-shaft and intermediate tightener pulley are furnished. Shipping weight, 900 lbs.

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